

THE AUTOMOBILE

Psychology of the Showroom

How Beauty and Harmony of Surroundings Help Sell Cars



1—HOW A MODEL SHOWROOM LENDS ITSELF BY LIGHT, ORDER AND BEAUTY TO THE AUTOMOBILE



ANY more sales will fall to the lot of the automobile salesman whose wares are displayed in a light, roomy, well-ventilated, artistic, clean and comfortable showroom than can be made by the same man under opposite conditions. Of two men equally equipped and selling cars of the same class, the one that enjoys the better salesroom surroundings will sell more cars.

Psychology plays a most important part in the selling of automobiles. There are scores of different methods in use by salesmen and selling organizations, all of which are based upon the study of the human mind and its operations, with abstract and incidental application. Psychology reduced to its simplest term is the science of human nature and

every salesman is obliged to take it into consideration if he is destined to make any marked success in his side of merchandising.

It has been truly said that there are no two human beings exactly alike and consequently no absolute rule can be laid down to govern salesmen in their relation to customers. In fact the same individual is rarely the same on two successive days and as a result the methods that might be acceptable one day would not answer the purpose at all on the second. But there are some general principles that apply to automobile selling that may be designated as axiomatic or fundamental, and these apply with almost equal force to any other line of salesmanship.

Advertising, under whatever guise it may be presented, lays the foundation for sales. It is the bait that attracts the buyers or possible buyers, and with that phase of the situation this article has nothing to do.

Assuming that an advertising foundation already has been laid



2—Salesroom in the middle of "Gasoline Row," where artistic and utilitarian features spell a big distribution and typical patronage

and that customers have been attracted, the next step is to justify the advertising expense by interesting prospective buyers in the line handled by the company. The personality of individual salesmen is an important point to be considered, previous acquaintanceship with the prospective is another, general reputation of the line is of necessity in the front rank, but quite as necessary as either of these is the setting of the car itself.

The day when it was possible to sell any kind of a car in any kind of surroundings is past. The customers of automobile selling establishments are growing more and more discriminating and the "hoo-raw" element has been eliminated to a large extent by automatic selection.

Of course, the business is still in a formative period, but it has progressed sufficiently to take it out of the "game" classification and place it among the great industries.

Therefore, as the business has grown to be keenly competitive the necessity for artistic and effective surroundings for cars

offered for sale has grown to be more and more important until to-day it is regarded as essential.

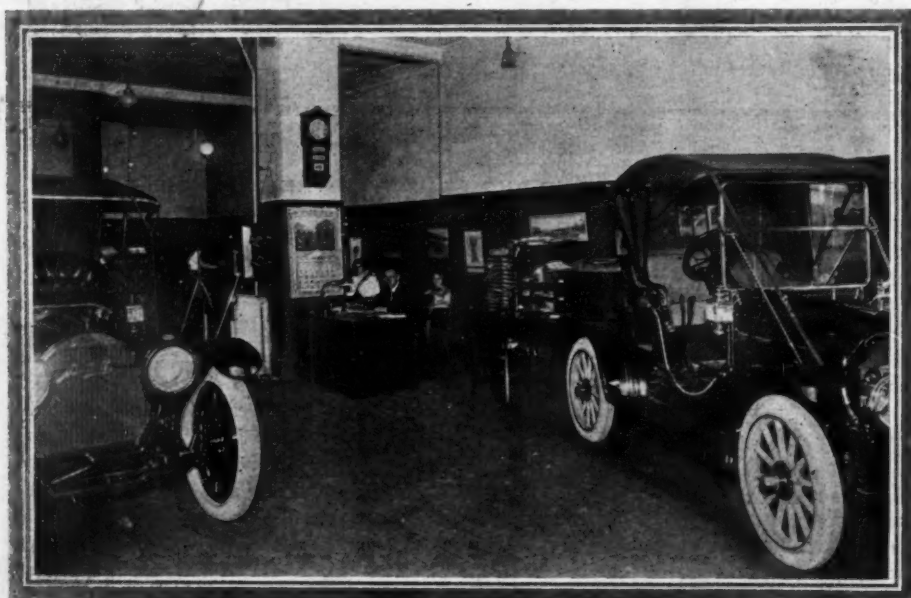
If a line of well-advertised automobiles is displayed in cramped quarters it may succeed, but it is certain that it cannot obtain the degree of success that it would if it had been shown in the midst of effective surroundings. Just what that means is susceptible of many constructions.

The day of the automobile "store," which was so popular a few years ago, has passed and in present-day practice the store idea has been abandoned. The greatest care is now observed in the arrangement of the showroom so that the line may be displayed to the utmost advantage. There are automobile establishments in New York City that rival anything in their class in the world and there are others that make one wonder how the cars they sell ever managed to obtain any considerable vogue.

On the one hand, there are salesrooms such as several shown herewith that have been built with the single purpose in view of displaying the car, and there are others, as indicated in some of the accompanying pictures, that would appear to handicap sales by reason of crowded conditions and such a multiplicity of models as to distract the attention of prospective buyers.

There are some gorgeous rooms, the interiors of which are like palaces, that seem so supremely attractive as to distract interest from the cars by centering it in the magnificence of the furnishings. Such rooms, of course, are not available for the sale of low or medium-priced cars and but rarely for housing even the highest grades of automobiles.

In New York City there are a number of highly ornate and ornamental rooms devoted to the automobile industry, but the most artistic and expensive of the lot was specially constructed to display its line of automobiles in the same way that the platinum setting of a blazing gem lends itself to



3—Cramped quarters and the dark and crowded store here shown will be exchanged shortly for a magnificent establishment in the same neighborhood

additional lustrousness of the gem itself.

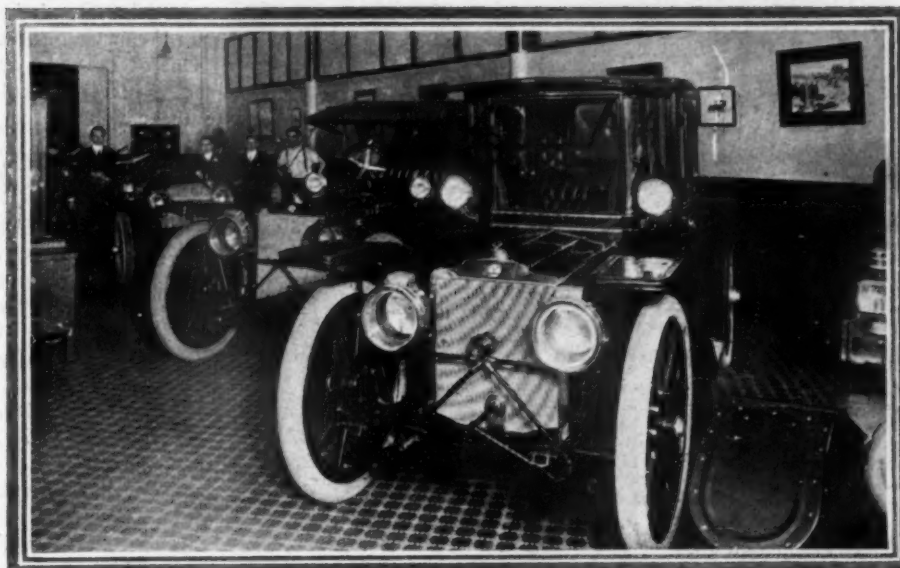
There are other types in which the element of luxury is subordinated and efficiency of display is emphasized. This type probably represents the highest development of the automobile showroom from the general viewpoint of results. There is no limit to price of the cars that may be economically sold amid such surroundings. For instance, one line of medium-priced automobiles recently has been moved into an unusually fine showroom in the heart of "Gasoline Row." The place is big and roomy, well furnished for the comfort of customers and is so arranged as to bring out the artistic lines of the cars in a way that was entirely impossible in the quarters formerly occupied by this concern.

On the other hand, some of the most expensive of the automobiles manufactured in America are handled in large scientifically built structures that are similar in furnishings and equipment in many ways to the quarters of this cheaper car.

It would seem as if the forces engaged in selling automobiles were striving to reach some sort of a standard for salesrooms.

There are a number of successful companies that occupy cramped quarters at present. This is accountable to the fact that they are progressing in size and importance and they have really outgrown their establishments. Several of the illustrations herewith indicate crowded conditions and in each case the company involved has either made arrangements for more commodious rooms or intends to do so in the near future.

One big concern leased what was considered an amply adequate store for its requirements, making the arrangement several years ago when its business in the metropolitan district was small. At that time it was possible to show two models in such a way that access could be had to them from all sides and from various

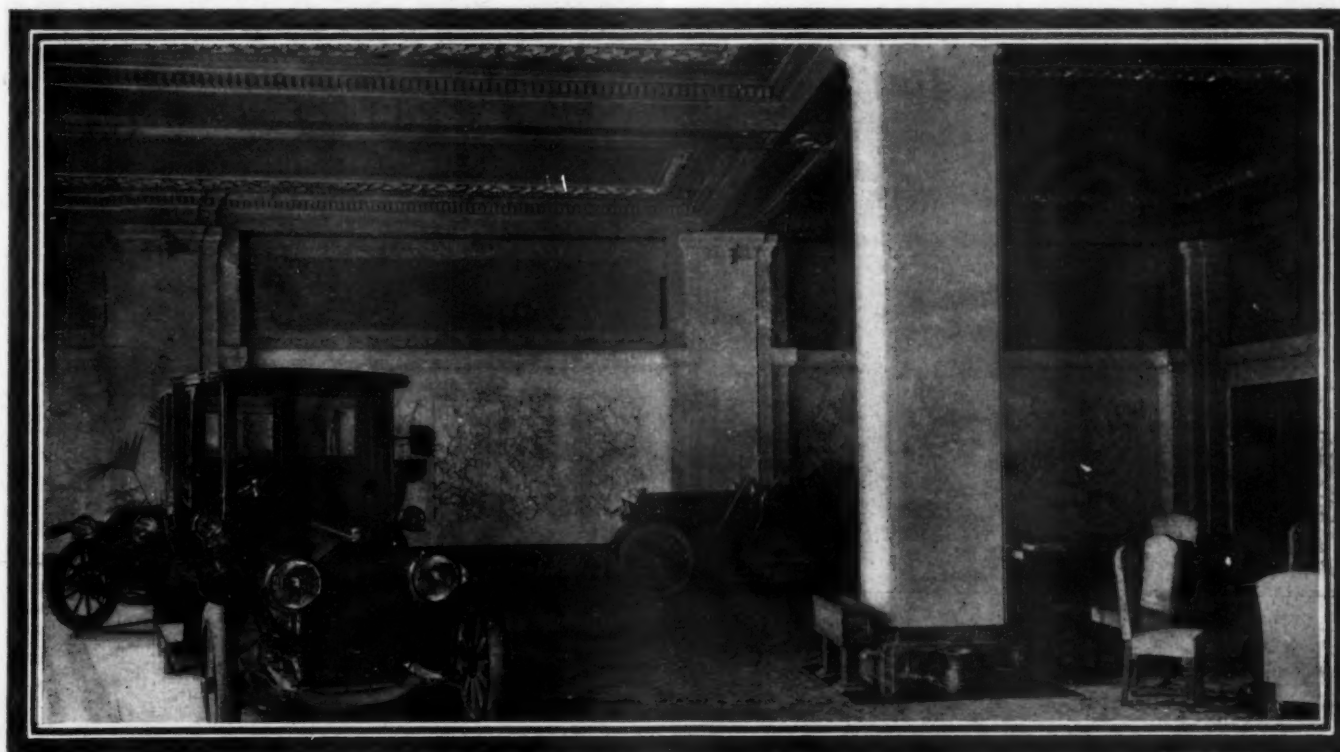


4—Conditions as displayed here have proved so trying to this big concern that it will move to a spacious location where opposite conditions obtain

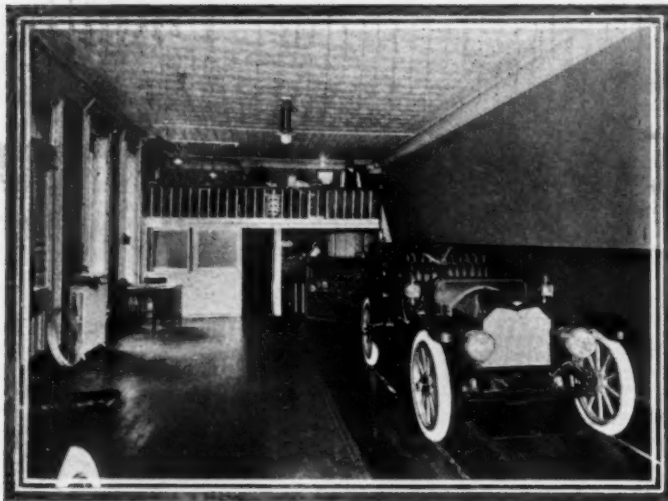
angles. The price was moderate and the car gave due service. The manager was fortunate in securing good salesmen and the combination proved successful. As business grew it became necessary to show another model and then another and as a result the showroom, ample for two cars, has proved much too small for four or more.

Consequently this company will remove in the near future to quarters nearly ten times as large as those occupied at present and it is safe to say that four cars will be the limit number of those displayed at the same time on the floor.

For quite another reason the quarters of the company shown in another figure seem to be crowded. This concern handles a double line of automobiles and is the eastern distributor for them in a territory that is very wide. Until recently it had quarters facing on a busy corner, but changes in the line of merchandise led to a change in location with the result that undue crowding



5—One of the most beautiful salesrooms in the world, where luxury and richness blend harmoniously to set off the merchandise



6—How a small room may be used advantageously to emphasize the attractive points of a single model

was experienced. This company will move shortly into a magnificent location further north on Broadway where it will have two floors of 10,000 square feet each, lighted with vast plate glass windows extending from floor to ceiling. In this place the same number of models that crowd the salesroom shown can be displayed in their individual beauty and attractiveness. As it is at present, it would endanger clothes to inspect all the models and by no chance could a proper perspective be reached. The new quarters will change all that.

In a number of the pictures it will be seen that a single car forms the focus of attention. Even where a concern handles a line consisting of a dozen or more models, it has been found advantageous to display only one, according to the aspect of some of these pictures. There is an element of psychology involved in this practice. The automobile salesroom in one sense is a store, inasmuch as the buyer is supposed to go there to purchase from its stock. But the selling of automobiles is somewhat different from selling groceries or cotton goods, because the customer rarely buys the identical car shown on the floor. Of course, he may do so in extraordinary instances, but as a general thing his purchase is made after observing a "sample" car.

Only in unusual cases is the company able to make delivery of a car to its purchaser on the same day the transaction is closed, for the reason that it takes time to get the car out of the warehouse or to have it shipped from the factory. Some of the companies do not promise delivery under thirty days.

For this reason a single attractive model, shown amid surroundings that harmonize with it and make for the comfort of



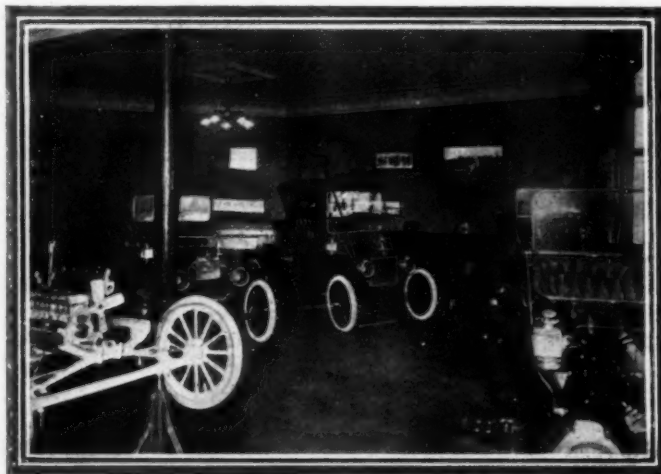
7—Vast expanse of plate glass and a businesslike showroom is sometimes used to exhibit one automobile with excellent results

the purchaser and the ease of his inspection, is considered better than the display of many models under any other conditions.

One of the most successful sales managers on the "Row" explained how he handled his business, particularly with reference to the assistance lent or obstacles imposed by the arrangement of his salesroom.

"In the first place," said he, "the physical aspect of the showroom in the automobile business is quite as important for the sale of cars as the appearance of a jewelry store or a furrier's establishment in the sale of diamonds, silver fox and sables. No matter what car is handled, its surroundings should be in harmony with it. To my mind it would seem the height of folly to crowd a room full of cars so that inspection would be difficult even in moderate degree. The place must be clean and bright. There is nothing so thoroughly out of place in an automobile salesroom as disorder. The car is a bit of mechanism, representing the last word in the development of transportation and deserves, first of all, to be clean in its surroundings. Second, the matter of light should be considered. If the showroom has a polished floor and the windows extend close to the floor, there will be an added quality to the light that will go a long way toward making sales. Third, there should be an understanding and intelligent arrangement of the interior of the room.

"If the establishment is large enough to handle a number of models, there is room for the display of considerable ingenuity



8—This picture shows the exception that goes to prove the rule, and still if more space and light were used the sales might be even greater

in their arrangement. Six cars backed against the wall with only just room enough to pass between them is not nearly as good as three models so placed that the customer has a chance to see them from all sides and to reach them from both ends.

"It is to be assumed that ventilation, heating and a reasonable degree of artistic merit in the decorations have been provided.

"In a showroom of only medium size which would be sufficient to house possibly eight cars, it is my idea to cut the number in half. I place one of the big cars, equipped with a striking top and attractive coloring, at an angle to the show window. This is to catch the eye of the casual visitor or passer-by to a certain extent, but in the main the object is to create a pleasant impression upon the prospective buyer who visits the establishment seeking an automobile.

"After passing the show window to the front door and seeing the big car nicely displayed, the visitor walks by this model and his interest is taken up with other things. Perhaps the car we have been pushing is one of smaller size and possibly we might have trouble in making prompt delivery of replicas of the big car, at any rate the buyer has a chance to see the first car and gain an impression of size and power from it. I have found it most effective to place the special object of our selling in the middle of the room where its lines will show to advantage and its points will be easily observable.

"I make it a point to have only a little furniture in the room so that nothing can detract from the cars themselves by distracting the attention of the customer. Naturally there must be a few chairs and settees and a little greenery is not amiss, but in my opinion these may be reduced to the minimum."

"The salesman should never meet the customer at the door, it gives a wrong impression of eagerness and has spoiled many a sale. Let him advance toward the caller a little less than half way, thus making the customer take the attitude of the inquirer. With the picture of the big car in his mind it is easier to direct the customer toward the leader of the line which may be of less cost, than it would have been if the positions of the models had been reversed."

"I have seen sales lost through over-eagerness on the part of salesmen, but I recollect no case of the kind that resulted from thoughtfulness in this particular."

"There is no element of misrepresentation in placing a big, expensive car in the most prominent place in the showroom as viewed from the street, even though your advertising campaign has all been directed toward the sale of some other model. Automobile buyers of to-day are not children and in the vast majority of instances I have found that they have a pretty general idea of what they want before they start out to make their purchases."

"After the interest of the customer has been aroused in the car it is time to explain the mechanical features as shown in a



9—Ordinarily three models are shown in this room, which is a model in its way, but stocks are low at this time of the year

cut-out chassis. I find that it is not necessary to place the chassis in the most prominent place in the room. Let it be off to one side, because the customer will have to be led to it in any event. In many of the best salesrooms no chassis is provided for ocular demonstration, that part of the sale being accomplished at the garage.

"Another thing that I would call particular attention to is to criticise the rather common practice of displaying used cars in the same place with the current stock. Automobile buyers are a sensitive lot. The bulk of them are business and professional men of wealth and importance in the community and as such they do not wish to throw themselves open to the charge that they are contemplating the purchase of a second-hand car. On the other hand, there are many estimable persons who do wish to buy second-hand cars and they, too, might have some little delicacy about examining the stock of used machines in the same room with their neighbors who may be buying new cars. Thus, there is nothing to gain and everything to lose by showing both varieties in the same room."

The whole matter may be summed up in a few words. From 5 to 30 per cent. of all inquirers for automobiles purchase cars. The percentage is much higher in the fine roomy establishments than it is in those where the cars cannot be displayed to the best advantage. Reckoning the average of



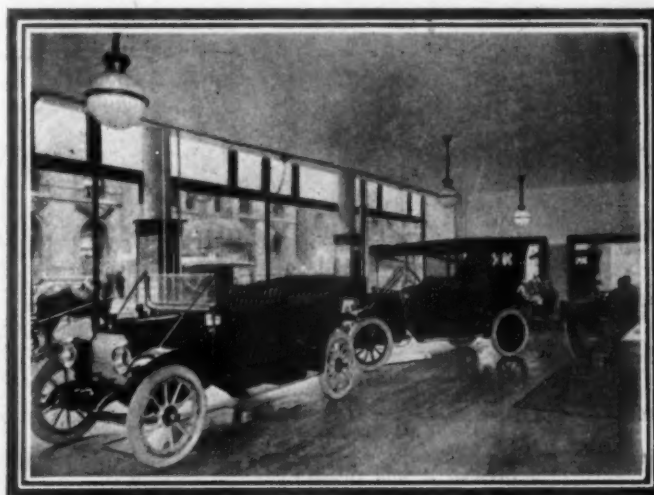
10—A little crowded, but effectively arranged. This room would look better with only two cars on the floor

actual buyers in the best of the shops at 15 per cent. of those who inquire and at the poorest establishments at 8 per cent., it will be seen that there is a vast amount of business that is accountable to good surroundings, or in the converse attitude, lost to some concerns because of opposite conditions.

Now that the automobile is on a strict dollar value basis, it behooves selling concerns to recognize the utility and necessity of conforming to the best practice as regards the setting of their merchandise. Only a few lost sales would represent the actual added money expenditure necessary to convert a "sow's ear into the proverbial silken purse," and on the other hand a few additional sales each season would balance the augmented expenditure.

Under sharply competitive conditions as they obtain now and as they will probably be accentuated in the future, additions to the business of a concern, even when achieved at the expense of a greater investment, must be reckoned as an important element in its life. Consequently the importance of scientific showrooms is of sufficient force to deserve even greater attention than has been given this feature so far in the development of the automobile industry.

CONCERNING TIRE DURABILITY—The life of a tire, other things being equal, is proportional to the square of the section diameter. The square of 4 is 16 and the square of 3.5 is 12.25. The life of the 4-inch tire from this point of view will be as 16 is to 12.25 comparing it with a 3 1-2-inch tire.



11—One of the most scientifically arranged show rooms in New York, the home of a concern that outgrew its old quarters on upper Broadway

Fatalities Mar Syracuse Meet

SYRACUSE, N. Y., Sept. 18—A day of splendid motor racing sport, upon what visiting cracks declared is the premier dirt mile track in America, was shadowed to-day by a tragedy in the special 50-mile event which cost eleven lives and the injury of half a score. In the forty-third mile of this race, watched breathlessly by a throng of 75,000 persons that jammed the giant stands and stretched many deep about the fences clear around the track, a front tire on the Knox machine, driven by Lee Oldfield, blew out upon the turn leading into the back stretch, the driver losing control and the car shooting diagonally across the track and into the outer fence, behind which were massed many spectators. The car plunged through the crowd, flinging mangled human forms high in air, and ploughing through a bed of soft cinders, turning over and over and stopping far beyond the scene of impact, a dismantled wreck. When the final toll was taken Saturday, it was found that eight

men and one nine-year-old boy, who was found clinging to his dead father's hand, had been killed and eight others had been injured, some fatally. Two others died on Sunday.

Despite the seriousness of the accident the contest continued, and at its close Ralph De Palma in his Simplex finished without a stop on one flat rim and with the new world's figure of 47:21.65 for 50 miles done on a dirt circular track to his credit. When the first half of the race was done he had negotiated a new 25-mile world's mark of 23:15.15. His division in this merged race was Division B, for cars 300 to 600 cubic inches displacement. In Division A, the Abbott-Detroit, driven by Mortimer Roberts, which plugged through without stopping, was the winner.

After the death-dealing crash occurred the drivers looked toward the officials as the machines came around the home stretch. Apparently the pilots expected the signal to stop. But none was given, and they kept on. It was by a miracle, seemingly, that others were not killed during the remainder of the race, for the track at the scene of the accident was half filled with people. In taking that turn for the remainder of the race, De Palma and the others reduced speed appreciably and threaded their way with wonderful dexterity among the reckless groups that had encroached upon the track.

With the conclusion of this race two more events—the second heat of the Remy Grand Brassard and the 5-mile open class—remained to be run. Starter Wagner lined up the contestants for the second heat of the Brassard event, but there was a menacing growl of dissent from the crowds. After a hurried consultation in the officials' stand the remainder of the program was called off. It was a ghastly finale to the most exciting day of motor racing sport this city has ever seen.

Shortly before the start of the fatal race, President Taft, the guest of honor for the closing day of the New York State Fair and the honorary referee of the automobile events, had been driven in an automobile and with a military escort past the stands.

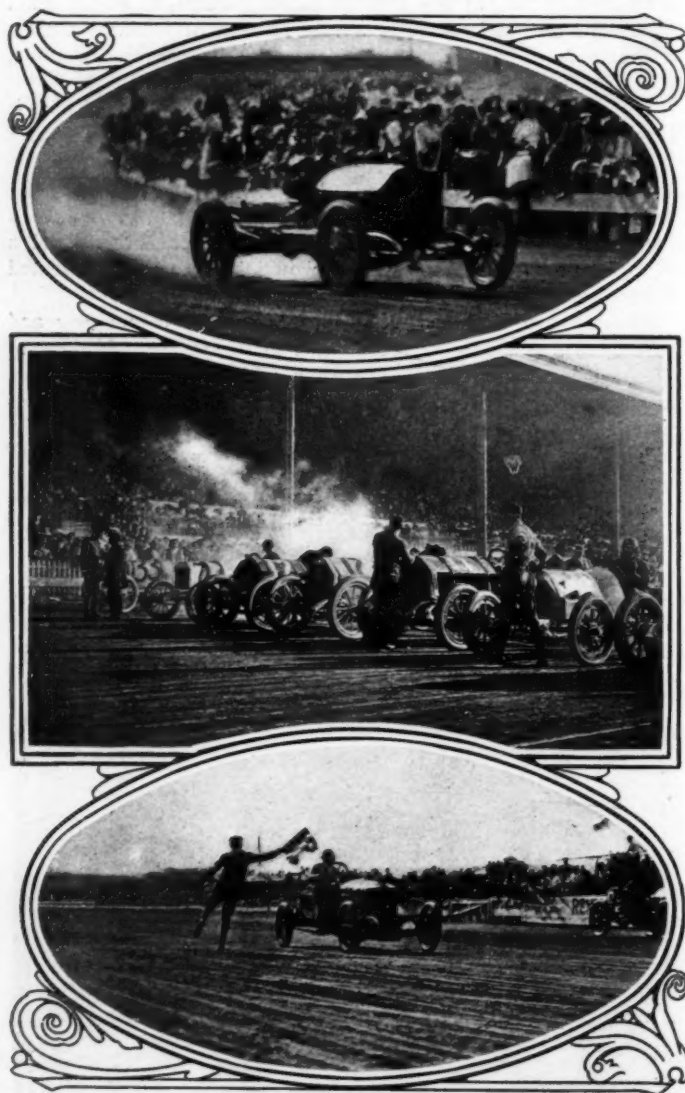
From the standpoint of racing, the day was a complete success. Earlier in the afternoon Burman broke the track record for a mile, flying start, with the Blitzen Benz, despite a broken piston. When his car began to wobble after the breakdown Burman worked like a Trojan at the wheel and managed to keep the car away from the fence. He lowered the track record of 48:92, made by De Palma in his Fiat here in 1910, by 1-10 second, and had it not been for his mishap, he would undoubtedly have bested the Brighton mark of 48:62, made on Labor Day.

In the event for the Remy Brassard and trophy there lined up De Palma in his "50" Simplex, Burman in a Jenatz Mercedes and Kilpatrick in his 200-horsepower Hotchkiss. De Palma won the race in 2:54.57, though Burman finished close to him.

In Division 2, Class C, 161 to 230 inches displacement, the Ford, driven by Frank Kulick, and the Abbott-Detroit, Mortimer Roberts, had a stubborn battle that brought the great crowd to its feet. Roberts succeeded in nosing out his opponent by half a car's length, and as he won again in his class in the 50-mile event, with the same car, he was one of the stars of the day.

The most sensational finish of the day was furnished in the 5-mile event for cars with piston displacement from 301 to 450 cubic inches, when Burman, in the Opel, trailed Turner in the Amplex for the entire distance till the last turn into the home-stretch, then sent his car down the stretch like a bullet, just nipping the honors at the wire by a nose.

The event for cars of piston displacement from 231 to 300 cubic inches proved to be a struggle between two speedy Mercers, and Hughie Hughes, out for blood, succeeded in beating De Palma, doing the 5 miles in 4:57.22.



Ralph De Palma in Simplex on last lap of 50-mile race, in which he established new records

Start of 50-mile race, run in two classes simultaneously, Simplex winning in Division B, and Abbott-Detroit in Division A

Close finish in the 301 to 450 race between Burman in an Opel and Turner driving an Amplex

In the seventh event, for cars 600 inches in displacement and less, with a minimum weight of 2,100 pounds, De Palma scored his first victory of the afternoon. Besides his Simplex and Burman's Opel, the other starters were the Amplex, driven by Bill Turner; the Knox, Fred Belcher, and the Cino, John Raimey. Belcher stalled his engine at the pistol's crack and was out of it without moving. At the end of the first mile Burman dropped out because of tire trouble. The Cino car retired during the next mile for a similar reason. At the end of the fourth mile the Simplex had a quarter-mile lead over the Amplex, the only other car left in the race. De Palma completed the tenth mile a half-mile in the lead in 9:39.56.

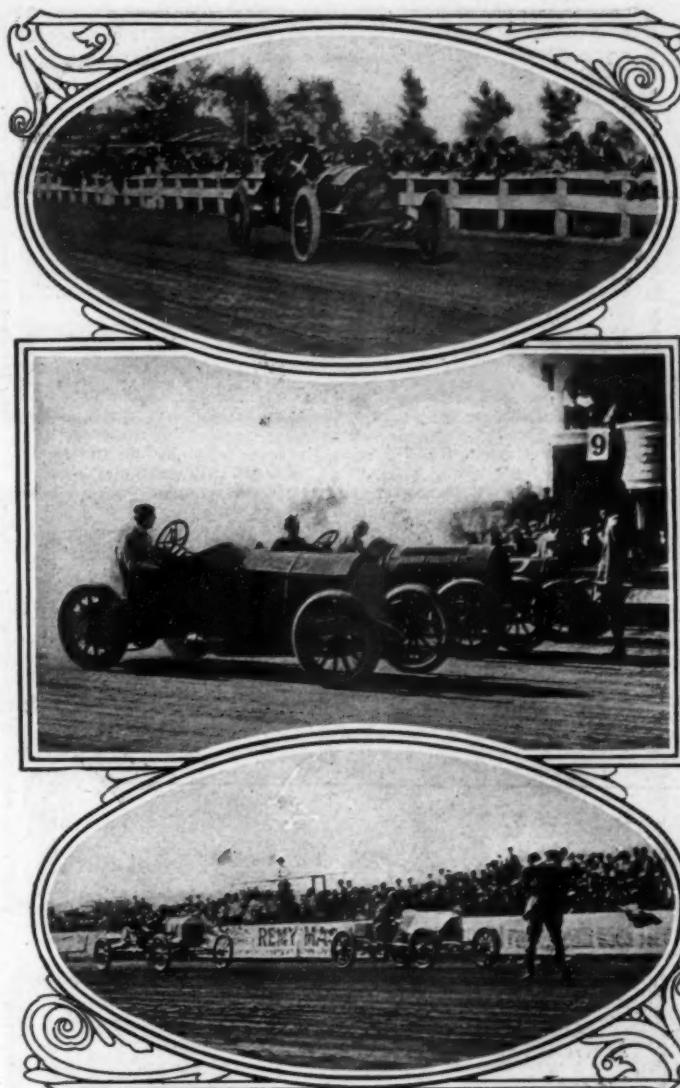
Just previous to the Remy Brassard event the Presidential party and escort passed around the track, preceded by a "water-wagon." Someone, in the desire to avoid the inhalation of dust into the Taft lungs, had given orders for a sprinkling cart to precede the parade. The entire homestretch was soaked and slippery and the starters for the Remy Brassard properly refused to endanger their own necks and those of the crowd till the track should dry. So there was an hour's delay, while everyone watched the aviator's flights and the balloon ascension.

When the race was finally started three cars leaped away in a flying start for the three-mile flight. Burman drove the Mercedes car which Lee Oldfield had been scheduled to drive. De Palma was at the wheel of his Simplex and Kilpatrick guided a Hotchkiss. The race was all between De Palma and Burman, though the Italian was never headed. The Mercedes came up to close quarters several times, but the Simplex leaped away, and in the final rush it captured first honors by 200 feet in 2:24.57.

There was another delay before the 50-mile race, was under way. A big field from the combined divisions faced the starter, including Burman's Opel, De Palma's Simplex, Oldfield's Knox and Turner's Amplex in Division B, while in Division A there were Hughes, Roberts, Morton and Raimey driving, respectively, a Mercer, Abbott-Detroit, Kline Kar and Cino. At the start of this ill-starred event the Simplex, next the rail, leaped away in the lead, and when the tangle had unsnarled the Opel was found in second place, close to its rival's wheel. Third was the little Kline Kar. The crowd in the stand cheered frantically as the cars came around the first time, and at the end of the second mile the order was unchanged. With the third mile, however, Burman had dropped back to third place, and soon afterward had to quit because of engine trouble.

De Palma's car continued to sweep around in splendid style, continually increasing its lead. The Knox grabbed second place for several miles, when Turner's Amplex headed it. And, by the way, in the programme Fred Belcher was scheduled to drive the Knox, and Oldfield was substituted without any announcement to that effect being made from the official's stand. This Knox car was sent here for the races from Springfield, Mass., the home of the Knox Automobile Company. It is the car which Belcher drove in the 500-mile Indianapolis race. Belcher drove it here from Springfield and it was then turned over to Lee Oldfield.

While the higher-powered cars were struggling, the sturdy little Abbott-Detroit kept plugging on. Other cars in its class ahead of it had to stop frequently to replace tires and the final result was that, without having to halt for any accident, it won.



Mercer No. 22, driven by Hughie Hughes, which captured first place in the race for cars of 231 to 300 cubic inches

Line-up for the start of the Remy Brassard, won by Simplex, De Palma, from the Benz and Mercedes

Abbott-Detroit, driven by Mortimer Roberts, winning the race for cars of 161 to 230 cubic inches

The race had drawn well toward its finish, and De Palma had long since annexed a new world's record for 25 miles, when the Knox and Amplex, which had been in close rivalry, tacked into the car of the flying De Palma, Oldfield in the lead. De Palma was then just a lap ahead of them. For circuit after circuit the race continued. Suddenly, in coming down the homestretch, a yell broke from the crowd. There was a loud report and the tread of one of De Palma's tires flew high in the air. He kept on and the rubber was immediately ripped in pieces by the crowd for souvenirs. On the second lap thereafter the accident occurred.

SUMMARY OF THE EVENTS HELD IN CONNECTION WITH THE STATE FAIR AT SYRACUSE, N. Y.

Pos.	Car.	Driver.	Time.
161 to 220 Cubic Inches, Five Miles			
1	Abbott-Detroit	Mortimer Roberts	5:05.79
2	Ford	Frank Kulick	
231 to 300 Cubic Inches, Five Miles			
1	Mercer	Hughie Hughes	4:57.32
2	Mercer	Ralph De Palma	
301 to 450 Cubic Inches, Five Miles			
1	Opel	Burman	5:01.34
2	Amplex	Turner	
Record Trial to Beat Track Record (48.92)			
	Blitzen Benz	Burman	48.82
600 Cubic Inches and Less, Ten Miles			
1	Simplex	De Palma	9:38.56
2	Amplex	Turner	
Opel, Knox and Cino also started.			

Pos.	Car.	Driver.	Time.
Remy Grand Brassard Race, First Heat, Three Miles			
1	Simplex	Turner	2:54.57
2	Mercedes	Burman	
Hotchkiss also started.			
(Second heat declared off, after accident.)			
Special Race, Fifty Miles (Two Classes Simultaneously)			
Division A, Cars Under 300 Cubic Inches			
1	Abbott-Detroit	Mortimer Roberts	
2	Mercer	Hughie Hughes	
Kline Kar and Cino also started.			
Division B, Cars 300 to 600 Cubic Inches			
1	Simplex	Ralph De Palma	47:21.65
Opel, Knox and Amplex also started.			



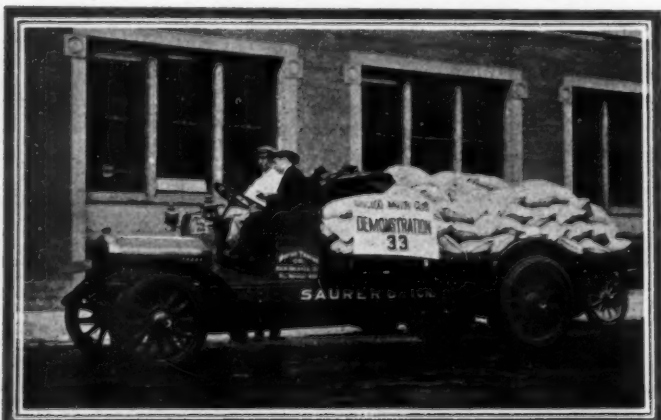
Durable Dayton, No. 27, being given the word by the starter



The Mais entry, No. 24, in Division 7-K, 4,001 to 5,000 pounds



Lauth-Juergens, No. 17, about to start away on the four-day journey



The Saurer representative in the big division, 10,001 to 15,000 pounds

32 Vehicles Start in

CHICAGO, Sept. 18—The first commercial motor vehicle test run under the system evolved by the rules committee of the Manufacturers' Contest Association, which makes the affair a demonstration instead of a contest, is now on, with the Chicago Motor Club acting as master of ceremonies. Complying with the wishes of the truck makers, the event is designed to show the business world just how the power vehicles operate in business service. The three routes chosen are mostly in the city or include adjoining towns which really seem to be parts of Chicago; the trucks carry their catalogued loads in the shape of sand; they are allowed ample time in which to make the trips and the penalizations are imposed only for replacements, taking on supplies outside of controls, for lateness and for damaged or lost parts as shown in the examination at the end of the test.

The routes selected for the affair aim to take in the entire commercial and manufacturing districts of Chicago and adjacent suburban cities. To-day the trucks went to Hammond by way of Whiting; to-morrow they run north to Evanston in the morning, stop at noon at the stock yards to allow the packers to inspect the cars and in the afternoon go to Oak Park and return; Wednesday the journey is a trifle more strenuous, being to Chicago Heights and return. The running schedules vary from 5 to 11 miles an hour, according to class.

As a means of comparison, the club has arranged to send out a two-horse truck carrying two tons of sand to-morrow, with Chicago Heights as its turning point. It is calculated that it will take at least two days for the horses to make the round trip, which will make them finish at the same time as the motor trucks, which, however, do not go to Chicago Heights until Wednesday.

In the entry line the club has made a record. In the first place it secured thirty-two nominations representing twenty-three concerns, which is a bigger entry list than the Chicago-Detroit run had and at five times the entry fee; in the second place every truck nominated started this morning from the White garage at Wabash avenue and Twenty-sixth street.

The first day's run eliminated only three of the perfect scores, one of them being a withdrawal, another a minor penalty for taking on oil and the third a big demerit which probably will put the car out of the running for a prize. The Swanson was the

ROSTER OF STARTERS IN CHICAGO TRUCK RUN

Division 2-K, 501-1000 Pounds						
No.	Car.	Driver.	Weight Full.	Weight Empty.	Weight Load.	First Day.
1	Mercury	Alkofer	2850	1810	1040	Perfect
2	Mercury	Lott	2890	1840	1050	Perfect
Division 3-K, 1001-1500 Pounds						
3	Clark	Odin	4770	3175	1595	Perfect
4	Buick	Easterday	4460	2680	1780	Perfect
5	Sampson	Krankey	4365	2860	1505	Perfect
6	McIntyre	Thomas	4225	2830	1395	Perfect
7	Crown	Hollnagel	4335	2680	1655	Perfect
8	Krickworth	Worth	4425	2710	1715	Perfect
Division 4-K, 1501-2000 Pounds						
9	Clark	McCue	5500	3400	2100	Perfect
11	LeMoon	LeMoon	5480	3400	2080	Perfect
10	Clark	Wallwork	5640	3520	2120	Perfect
12	Little Giant	Aplin	4860	2780	2080	Perfect
14	Adams	McLean	5860	3785	2075	Perfect
15	Swanson	Severin	4925	2840	2085	Out
16	Lauth-Juergens	Juergens	5620	3500	2120	Perfect
17	Lauth-Juergens	Herrick	5430	3330	2100	Perfect
18	Decatur	Mattoon	5990	3940	2050	Perfect
19	Monitor	Barnikow	5010	2940	2070	668
20	Chase	Mraz	4700	2630		Perfect
Division 5-K, 2001-3000 Pounds						
21	McIntyre	Smith	6720	3675	3045	Perfect

Chicago Truck Run

one to pull out, its withdrawal being caused by a skid which broke a radius rod on the run home this afternoon. The Monitor first had clutch trouble, then rear axle trouble, which brought 338 points penalty, to which was added 300 more for being late at the night control. The veteran Reliance, known as old Adam and which is declared to be the oldest truck in Chicago from a service standpoint, having been running for a local brewery for 5 years, had to take on oil, for which it was assessed 3 points. The oiler on old Adam is a small one, fitted years ago when no one expected the trucks to do their 60 and 70 miles a day.

The run to Hammond and back to-day was more of a strenuous test than had been anticipated when the route was laid out. Ordinarily the trip would have been an easy one but Sunday night Chicago was deluged by a downpour of rain that "raised Cain" with the country roads. Of course the trucks could not run on the boulevards and to add to the trouble it was forbidden to strew confetti inside the city limits, which made the drivers go carefully in order to avoid losing the course. On top of this the contestants on their way back found a big gang of workmen tearing up the street car tracks at South Chicago avenue and Stony Island avenue, where the road is not too good anyway. This caused a congestion that looked serious for a time, but eventually the tangle was straightened out and everyone got through.

The noon stop at Hammond found every truck there on time. The 1-ton Decatur, pneumatic shod and carrying a ton of sand, made a remarkably quick run of it, covering the 20 miles in 1 hour and 18 minutes. It was demonstrated, however, that a pace of 11 miles an hour is a trifle too fast for the lighter vehicles over such roads while the big fellows are not asked to go fast enough on a 5-mile an hour rating.

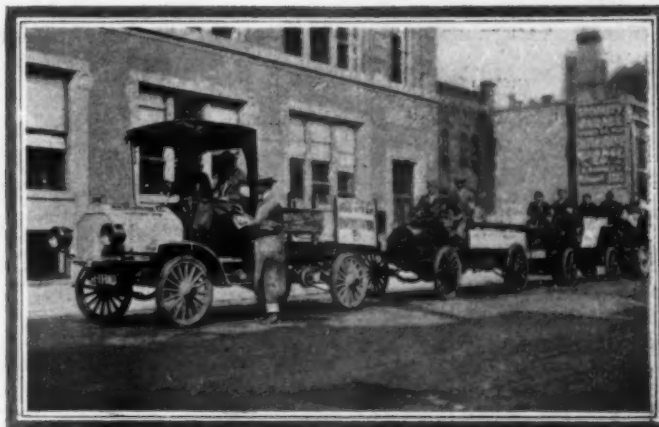
It is interesting to note that the thirty-two vehicles carried in all 61 tons of sand which shows that the average load capacity of this representative field runs close to 2 tons per car—a very high average indeed.

Six Penalized the First Day

CHICAGO, ILL., Sept. 19—The second day of the commercial motor vehicle demonstration saw five penalizations and of this number two withdrew—No. 32 Alco and No. 21 McIntyre. The former burned out a bearing, while the latter hit a beer wagon,

ROSTER OF STARTERS IN CHICAGO TRUCK RUN

Division 6-K, 3001-4000 Pounds						
No.	Car.	Driver.	Weight Full.	Weight Empty.	Weight Load.	First Day.
23	Stegeman	Stegeman	9320	5050	4270	Perfect
23	Reliance	Carney	9975	5830	4145	3
Division 7-K, 4001-5000 Pounds						
24	Mais	Davies	11835	6720	5115	Perfect
Division 8-K, 5001-7000 Pounds						
25	Alco	O'Mara	15900	8745	7155	Perfect
26	Old Reliable	Kline	15165	7975	7190	Perfect
27	Durable Dayton	Haines	13510	7450	6060	Perfect
28	Pope-Hartford	Russell	13440	7330	6110	Perfect
Division 9-K, 7001-10,000 Pounds						
29	Saurer	Atwell	15930	6790	9140	Perfect
30	Stegeman	Stegeman	16340	8215	8125	Perfect
31	Sampson	Shires	20900	10800	10100	Perfect
32	Alco	Rooney	20430	10370	10160	Perfect
Division 10-K, 10,001-15,000 Pounds						
33	Saurer	Berger	21525	8380	13145	Perfect



McIntyre, No. 21, only starter in 2,001 to 3,000-pound class



Clark No. 10, Wallwork, driver, one of a pair in 1,501 to 2,000-pound class



Stegeman, No. 30, which started in the 7,001 to 10,000-pound class



Sampson and Buick, two starters in 1,001 to 1,500-pound division



Pope-Hartford, No. 28, which will strive for the honors in Division 8K

demolishing the steering gear. Besides this, No. 2 Mercury, was penalized 72 points for coil trouble; No. 14 Adams, 6 points for taking on oil outside of control, and No. 23, Reliance, which was penalized yesterday 316 points for replacing a bearing. No. 19 Monitor, heavily penalized yesterday, did not start to-day.

The run to-day was to Evanston in the morning, returning for the noon stop at the stockyards, where the trucks were held an hour and a half in order that they might be inspected by the packers, while in the afternoon they went to Oak Park and back, making a day's journey of 61 miles. The stockyards stop was a happy idea, for great interest in the trucks was shown by the packers, and it is expected that considerable business will result.

The horse-drawn truck, loaded with two tons of sand, made its getaway this morning and to-night is at Homewood, 20 miles out.

No one wanted No. 13, so it was given to the horse rig, which is expected to finish to-morrow afternoon, using two days for a journey the truck will make in one.

With two-thirds of the run over there are two-thirds of the contestants left with perfect scores. It looks as if there will be at least 20 clean to-morrow night. Thursday morning there will be a mild sort of a final examination, in which only the steering gears, brakes and transmissions of the contesting vehicles will be examined.

Good Roads Congress in Chicago

CHICAGO, Sept. 21—The fourth annual international good roads congress and exposition opened in Chicago yesterday for a lengthy run, with representative men from all sections of the country in attendance. The congress is being held at the La Salle Hotel, and will continue to October 1. Governors of many States have promised to attend and it is hoped to have one of them preside each day of the congress. Arthur C. Jackson is president of the congress, and among the weighty propositions he has mapped out for discussion are the Jackson memorial highway, a national turnpike from Los Angeles to New York, and the proposed Lincoln memorial highway. The congress also is expected to strongly advocate the employment of convict labor on the roads.

Chapin Named as Good Roads Delegate

DETROIT, Sept. 18—Roy D. Chapin, of the Hudson Motor Car Company, is one of the five Detroit men named by Governor Osborn to represent Michigan at the Fourth International Good Roads Congress, to be held in Chicago September 18 to October 1. The others are: Edwin S. George, Horatio E. Earle, father of the good roads movement in Michigan; Ben Otto and H. S. Nimmo.

Chalmers Owners Tie

DENVER, Sept. 18—The second annual Chalmers Owners' Consistency Tour, run on Thursday and Friday last, from Denver to Estes Park and return, resulted in a tie between Allen DeBerry Bowen, driving car No. 3, and Dr. Edward Lazelle, driving car No. 18. The result was in doubt throughout the entire race. Twenty-four cars entered the event, and, although all were driven by amateurs, there was not a single instance of mechanical trouble in the entire distance of 200 miles, and the tire troubles were confined to the one car driven by E. B. Field, Jr. Within the coming week the two leading cars will decide the tie by a run to Colorado Springs and return, and it is expected that a number of other auto enthusiasts will act as escorts.

Messrs. Bowen and Lazelle had only two points charged



Alco pair, both of which finished with a perfect score on first day

against them, and the third car, driven by F. C. Dreher, was charged with only three points. The showing is remarkable inasmuch as the drivers were comparatively unskilled in tour driving and that there were nine secret controls along the road, a penalty of two points being made against any car passing the control either two minutes behind or ahead of schedule.

The twenty-four competing cars left the starting point at 8:30 Thursday morning. They were started off one minute apart, the schedule being so arranged that the average speed of the first car was 17 miles an hour, the second 18 miles, the third 19 miles, the fourth 17 miles, and so on.

Fairmount Park Race Comes Next

Eight entries have been received so far for the Fairmount Park road race, the classic automobile event staged each Fall at the Quaker City. The event is scheduled for October 7 and in the past has always developed a picturesque contest. The entry list is limited to thirty cars and the experience of the past has been that the bulk of them come in late. Usually the list grows to about ten until a week from the date of the race when the box is swamped.

The race is to be held under the auspices of the Quaker City Motor Club and will be run in Class C, Divisions 3C, 4C, 5C and 6C. The entry fee is \$500 and the winner in each division will get \$1,000. The grand prize for the fastest time will be \$2,500 in addition to the class prize that goes with it. The distance of the race will be 25 laps of an 8-mile course laid out on the west side of the park. The police arrangements this year will be practically the same as they were last, when nearly 2,000 men guarded the course.

F. E. Edwards, chairman of the Technical Committee, will be in charge of the examination of the cars. Fred C. Dunlap will act as referee and Fred J. Wagner will line up and start the contestants.

Ford Wins Omaha Run

OMAHA, NEB., Sept. 18—A Ford car won the third annual *World-Herald* automobile run, under the auspices of the Omaha Motor Club. A Marion was second.

The Ford was entered and driven by Max Gottberg of Columbus, and the Marion was entered by the Marion Auto Company of Omaha. The prizes were \$250 and \$150, given by the *World-Herald*.

The four-day run, Sept. 12-15, was from Omaha to North Platte and return, a total of 666 miles.

The scores of the cars follow:

No.	Car.	Technical Score.	Road Score.	Total.
5.	Ford	13	1	14
12	Marion	33	perfect	33
6	Velie	35	3	38
1	Lexington	25	17	42
27	Paige-Detroit	50	perfect	50
10	Maxwell	54	perfect	54
3	Ford	37	22	59
14	Alco	98	perfect	98
7	Chalmers	195	perfect	195
9	Case	139	57	196
4	Lion	192	17	209
16	Paige-Detroit	115	138	253

No. 8, a two-ton Kelly truck entered by Andrew Murphy & Son, made the complete trip in but little longer time than the touring cars, and with perfect road score.

Velie No. 6, which was penalized 35 points as a result of the technical examination, had but three demerits on the road.

Ford No. 2, entered and driven by Ed. Brown, sustained a cracked steering housing near Lincoln, but arrived in Omaha ahead of scheduled time. Aside from this it had few points against it, but was withdrawn from the contest. The other cars in the run were the Inter-State pilot car, the Inter-State official car, Hupmobile and Ford press cars.



Old Reliable, No. 26, prominent contender in 5,001 to 7,000 pound division

Seeks to Enjoin R. C. Hupp

DETROIT, MICH., Sept. 19—Following close upon the retirement of R. C. Hupp from the Hupp Motor Car Company, of Detroit, a bill of complaint was filed to-day by that company in the Wayne County (Mich.) Circuit Court, asking for a permanent injunction restraining Hupp and others associated with him in a new company called the Hupp Corporation from using the name "Hupp" in connection with the manufacture and sale of gasoline automobiles, or in any other manner that would injure the business of the Hupp Motor Car Company; and especially in connection with the manufacture of a small car which, according to announcement, is to be placed on the market by the Hupp Corporation.

The bill alleges that R. C. Hupp and brother, together with the Hupp Corporation, have violated the rights of the Hupp Motor Car Company by the use of the name "Hupp" in the automobile business, inasmuch as the Hupp Motor Car Company used that name at the request of Mr. Hupp when the company

was incorporated, and has made the name well known to the trade and to the public in general; that the use of the name "Hupp" by Mr. Hupp in the new company, the Hupp Corporation, has been, and will be, a source of confusion and embarrassment to the Hupp Motor Car Company and its dealers, to manufacturers and the general public with whom it does business; and that such use of the name "Hupp" as already made on the part of Mr. Hupp and his associates in the company called the Hupp Corporation is an attempt to trade illegally upon and benefit by the reputation and standing of the Hupp Motor Car Company.

Moline Factory to Be Doubled in Size

MOLINE, ILL., Sept. 18—Contracts providing for the erection of three buildings have been let by the Root & Van Dervoort Engineering Company, a subsidiary concern of the Moline Automobile Company. This will double the output of the plant. Work on the new buildings has already been commenced. The company is far behind on orders, due to inadequate facilities and expansion was absolutely necessary. The new buildings are:

Assembling building, brick construction, one story high, lantern roof, block floor, ground dimensions 85 x 258.

Testing and painting building, ground dimensions 70 x 375, one story basement and floor of concrete construction, lantern roof.

Casting storage building, ground dimensions 70 x 80 feet, one story. After the new buildings are completed assembling work will be carried on in the new building for that purpose instead of the machine shop as is now the case. A large amount of new machinery has been ordered.

New Officials for Mais Company

INDIANAPOLIS, IND., Sept. 18—At a recent meeting of the stockholders of the Mais Motor Truck Company, H. W. Moore was appointed assistant treasurer. The directors appointed for the ensuing year are: John Saulter, Dr. A. E. Sterne, A. W. Markham, C. L. Chandler, W. H. Roberts and Albert Mais. President Brown contemplates establishing a school for drivers at the factory in the near future.

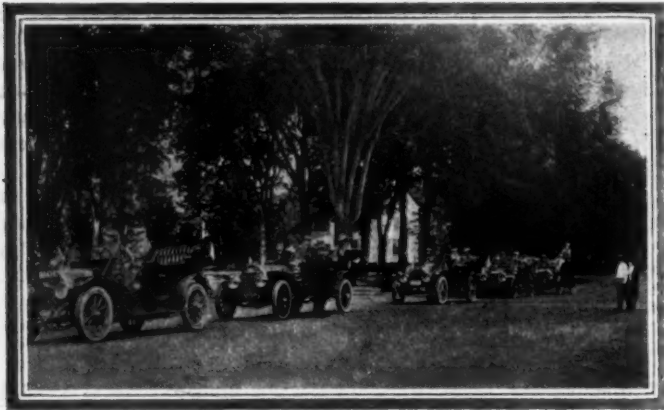
Promoters Must Protect Public

While no definite announcement of a change in sanctioning contests on dirt tracks has been made by the Contest Board, it is pretty generally understood that it will be exceedingly difficult to gain official recognition for such race meetings in the future.

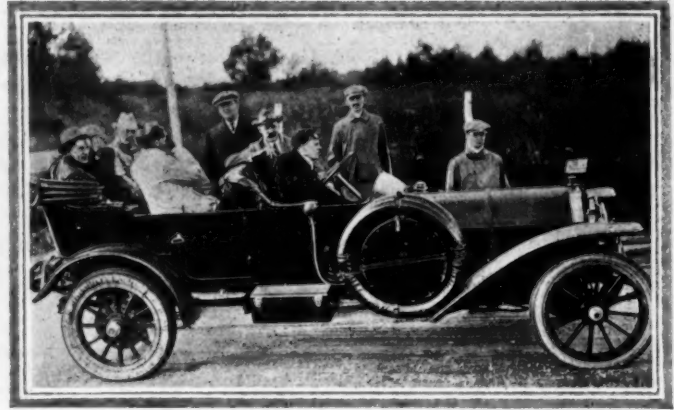
For the events already sanctioned to be held on dirt tracks, the Contest Board is insisting that due precautions be taken to prevent any recurrence of such disasters as befell at Syracuse last week.



The Saurer and the Stegeman entries in the 7,001 to 10,000 pound class



Showing the caravan leaving Pittsfield for Lenox on the first day



New York Commission, Director Page and Col. Sohler at top of Jacob's Ladder

Highway Experts Inspect Roads

REPRESENTATIVES of the road departments of New York, Massachusetts, Connecticut, New Hampshire, Washington and of the United States completed on Tuesday a three-day inspection of New York and New England road construction, under the auspices of the Touring Club of America. The party started from Albany Sunday morning and proceeded to Pittsfield and then to Springfield, Mass. On Monday they circled around Springfield and then went south to Hartford and Old Saybrook, finishing the day's run at Waterbury. On Tuesday local inspections were made and the tour was concluded.

Banquets and informal discussions on practical, theoretical and actual road-building were held at Springfield, where the party was entertained at the magnificent New Kimball, and at Waterbury, where the road commissioners stayed at the Elton.

The purpose of the tour was not the interchange of ideas between the road authorities so much as bringing into personal contact the men who have charge of road improvements. A most astonishing condition was developed at the banquet held at Springfield, where, under the direction of Dr. Logan Waller Page, Director of the office of Public Roads of the Department of Agriculture, all the road commissioners and experts outlined present and past practice in their art and told of experiments and their result. Each speaker in taking the floor specifically denied that he had discovered the ideal road from the viewpoint of the user and stated that there was an element of doubt as to the utility of any of the various practices in use to-day.

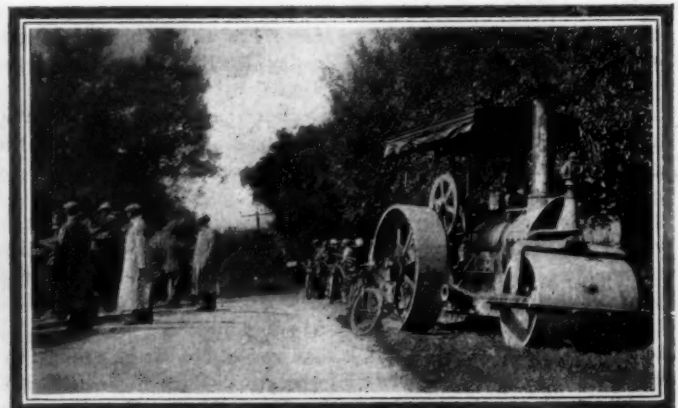
Commissioner Kemp, of Massachusetts, made a characteristic speech in which, after stating that he knew little of road building, he went on to give a detailed account of some of the Massachusetts roads in which he, as a member of the commission, has direct supervision. Mr. Kemp described the highway followed by the party from the New York State line, taking it mile by mile, and told how eight different types of roads were included in this short route. He said that each mile presented its own problem and that the same type of construction, used by the same volume of traffic, often produced widely different results, while different methods of road building always resulted in some variance of service, durability and maintenance cost.

He said that his State took little pride in the new road which has been constructed around "Jacob's Ladder," but indicated that the time is not far off when road-building will assume a more settled attitude. This, he said, was shown by the offer of one of the Massachusetts division engineers, who agreed to take the contract for maintaining the roads in his district and give a bond to insure this service for less than \$400 per mile, per year. As a condition, this engineer required that the roads should be properly built and crowned and treated with a blanket preparation of oil and fine stone.

Mr. Kemp drew the unavoidable conclusion from his observations that automobile traffic does not wear out the roads with anything like the speed and certainty that follows horse traffic. He pointed out that on several stretches of highway where the crown was in the proportion of 3-4 of an inch to the foot, or more, so that the road was not usable for horse-drawn traffic,



The party leaving Hotel Kimball, Springfield, Mass., on Tuesday morning



Inspecting a new-laid road en route to Springfield, Mass.



Commissioners at luncheon stop in front of the Wendell, Pittsfield

it stood up for years under the automobile travel, while other roads where the crown was not so pronounced, disintegrated, ravelled and were destroyed by the combined traffic.

Dr. Page presided over the session, which was addressed by Mayor Lathrop, Commissioners Sohler, Catlin, Hill, President Whiteside of the Stevens-Duryea company and numerous others of the tourists and local enthusiasts.

On Sunday the tour started from the Hotel Ten Eyck, Albany. Noon control was at the Wendell House, Pittsfield, Mass. On Monday the investigations were so prolonged in Massachusetts that the mid-day stop scheduled for Old Saybrook did not take place until late in the afternoon.

A fine banquet attended by about forty, was held at the Hotel Elton at Waterbury, at which Road Commissioner MacDonald, of Connecticut, made an interesting speech with regard to his sixteen years as a conservator and builder of roads.

The tour was a remarkable success in every way, the members making a careful study of road conditions, but best of all becoming acquainted with one another so that in future there will be more exchanging of views and data, to the profit of motor-dom.

Great praise was extended to the Touring Club of America for its enterprise in bringing the road experts together and for its care in arranging the details of the trip.

The following took part in the tour: Logan Waller Page, Paul D. Sargent, United States Government; William H. Catlin, New York State Superintendent of Highways; John A. Bensen, State Engineer; Charles E. Treman, State Supt. Public Works; Gordon Reel, Highway Department; A. H. Rennie, T. C. A.; J. D. Barnhill, Treasurer T. C. A.; Henry MacNair, Blue Book; F. H. Elliott, Secretary T. C. A.

Massachusetts: Highway Commission: Harold Parker, William D. Sohler, Frank D. Kemp; L. J. Minahan, T. C. A.; William M. Kimball, T. C. A.; John A. Coulthurst, vice-president T. C. A.; Mayor E. H. Lathrop, William H. Whiteside, presi-



Showing an ideal wide macadam driveway in the Berkshires

dent Stevens-Duryea; H. C. Tenney, T. C. A.; W. M. Stevenson, T. C. A.; Albert E. Lerche, President Automobile Club of Springfield; H. A. Brooks, T. C. A.; C. P. Pierce, Arthur Adams.

Connecticut: State Highway Commission: James H. MacDonald, Almon C. Judd, President New England Hotelmen's Association.

New Hampshire: State Engineer, H. C. Hill.

Washington: L. J. Hewes.

City Sued for Oiling Streets

WALTHAM, MASS., Sept. 16—The question of whether a city or town has the right to oil its streets instead of watering them will be settled by the Massachusetts courts in the future as a result of a suit filed against Waltham on behalf of Mrs. Henry Endicott, of Boston. She was being driven through Waltham some time ago when her motor car skidded and she and her two children, her mother and the chauffeur were thrown out when the car struck a pole.

The contention is to be raised that the street had just been oiled, and that too much oil had been used, thereby making the roadway slippery and dangerous, and that through no fault of the driver the accident happened, but that the surplus of oil constituted a defect in the highway. The progress of the suit will be watched with interest by good roads advocates.

The accident happened at a curve and it is claimed that the motor car was running slowly, but it skidded so sharply it got beyond control of the chauffeur. All the occupants were injured, Mrs. Endicott sustaining a broken knee cap, her mother, Mrs. Francis P. Sears, was cut on the head and the children were bruised and unnerved. The car was badly damaged, too. The family is one of the most prominent in Boston society and so the case will be pushed.



Resurfacing old roadway with a coat of tar oil and stone screenings



The party leaving Stockbridge on the road to Lee, Mass.

Trade Is Booming at Detroit

DETROIT, MICH., Sept. 18—With the Studebaker Corporation adding another plant, to be known as No. 10, to its Detroit industrial group, with work well under way on the Continental Motor Manufacturing Company's extensive new factory out in the Fairview district, and with plans either completed or nearing completion for at least two more mammoth automobile plants in the north end, the local outlook for the immediate future of the industry is anything but discouraging.

The big event of the week in local motor circles was the purchase by the Studebaker Corporation, through Walter E. Flanders, general manager of the Detroit factories, of the Ford Motor Company's old plant on Piquette avenue, directly east of the No. 1 plant of the E-M-F division. This gives the Studebaker interests two square blocks in this vicinity and adds greatly to their facilities. The plant had been practically deserted for some time, the Ford Motor Company having abandoned it as an auxiliary factory. New machinery will be installed at once and the factory put in operation as soon as possible with a force of 1,000 men. As already indicated, it will be known as E-M-F plant No. 10.

With regard to the purchase, Mr. Flanders said: "Our only purpose in acquiring the old Ford plant is to facilitate the extensions of our business. We propose to build 50,000 cars for the 1912 season. Of these 30,000 will be the Flanders "20" and 20,000 the E-M-F "30." One of the main purposes in bringing our dealers from all over the country to Detroit is to show them that we are going ahead just as fast as we can in the work of increasing our facilities. Within 60 days we will be manufacturing 250 cars a day."

Ground was broken last week for the Herreshoff Motor Company's new factory on Woodward avenue, between Belmont and Trowbridge avenues, the site occupying an entire square. The property immediately adjoins Boston Boulevard, one of the most exclusive residence streets in the city.

The company aims to make the new plant, because of its prominent location, as attractive as possible, a model in fact. The separate administration building, fronting on Woodward avenue, will be of red brick and cement, with ornamental tiling in front and sides. The interior will be finished in white enamel and mahogany. This building will contain, besides the offices, spacious showrooms and a reception room for out-of-town customers. The factory will conform to the administration building in exterior appearance. The power plant will be separate from the rest of the institution and will be located in the furthest corner of the lot.

W. C. Durant, formerly head of the General Motors Company, and the "man behind" the recently organized Chevrolet Motor Company, is the reported purchaser of 40 acres of land on Woodward avenue, north of the car barns, in Highland Park, which was sold by the Highland Park Land Company last week. Mr. Durant will neither affirm nor deny the report, but it is taken for granted in motor car circles here that he is the buyer and that he has acquired the property for the Chevrolet Motor Company as a site for a factory. The price paid was about \$160,000.

While its plans have been kept well under cover, it seems to be pretty generally understood by men in the business that the company is preparing to manufacture two models, a "four" and a "six," both of French design and right up to the minute in the matter of equipment.

The Highland Park Land Company, from whom the site for the Chevrolet plant is reported to have been purchased, is composed largely of men closely identified with the Ford Motor

Company, including Henry Ford, James Couzens, H. H. Rackham and others.

Work on the big plant of the Continental Motor Manufacturing Company, on Jefferson avenue, just east of the Hudson plant, is progressing rapidly, and an effort will be made to have it in operation by January 1. From 1,000 to 1,500 men will be employed. It will comprise eight buildings and a power plant. All of the buildings will be two stories high, except the machine shop (which will be a saw-tooth affair, 200 x 280 feet), and will be of steel and concrete construction, with steel sash. The factory at Muskegon will continue in operation, but the general offices of the company will be here. The present officers are: President and treasurer, B. F. Tobin; vice-president, R. W. Judson; secretary, H. J. Warner.

Detroit is to become the headquarters of the Mexico Latex Company, which manufactures rubber from the milk of the castilla plant. Louis F. Newman, of this city, is president.

A new sales company, known as the Marquette Company, has been organized as a subsidiary of the General Motors Company, and will handle the product of the Marquette Motor Company, manufacturing the Rainier and Welch-Detroit cars and the new Marquette. The officers are: Thomas Neal, president; O. C. Hutchinson, vice-president and manager; James T. Shaw, treasurer; Standish Backus, secretary; T. S. Merrill, assistant secretary and assistant treasurer. Headquarters have been established at 1302 Jefferson avenue. The merger of the Marquette Motor Company and the Welch-Detroit Company was announced some time ago.

A \$1,000,000 company is being organized by Detroit and Lansing capitalists to manufacture a new motor fire chemical engine, the distinctive feature of which is that it pumps water from the mains like any other fire engine, the water being charged with a chemical as it passes through the engine. The engine, as designed, has a capacity of 350 gallons of chemicalized water per minute. A plant is to be erected either in Detroit or Lansing as soon as the organization plans are completed.

The directors of the General Motors Company have declared a dividend of 3 1-2 per cent. on the preferred stock, to be paid on October 2 to the stockholders of record on September 22.

At the annual stockholders and directors' meeting of the Abbott Motor Company, held last week, the officers were all re-elected for the ensuing year, as follows: President, C. W. Jamieson; first vice-president, F. M. Knapp; second vice-president, H. M. Preston; secretary, Wade Millis; treasurer and general manager, M. J. Hammers; assistant general manager, B. C. Spitzley; sales manager, W. T. Bush.

Pullman Company Builds Taxi

YORK, PA., Sept. 18—The Pullman Motor Car Company has gone in the taxicab building business, and this new type of car has been added to its line of models. About thirty of these cars are for the Pullman Taxicab Company, Philadelphia, and six were shipped last week to the Quaker City. The cars will be mounted on a regular Pullman chassis, Model O, 30 horsepower.

Norwalk Company Settling Affairs

NORWALK, OHIO—The affairs of the Norwalk Motor Car Company, which have been in the hands of two receivers, appointed by the Common Pleas and Federal Courts, have now reached Attorney Ben B. Wickham, referee in bankruptcy for Huron county. The referee will call a meeting of the creditors to give them an opportunity to select a trustee.

907 Miles in 12 Hours

LONDON, Sept. 11—In a recent test carried out on the Brooklands track a particularly noteworthy feat was accomplished by the Sunbeam car. It consisted of driving a car fitted with a six-cylinder motor of 90-millimeter bore and 115-inch stroke (3 2-5 inches x 4 3-5 inches), for one round of the clock, averaging approximately 80 miles per hour. As a precautionary measure the tires were changed every two hours. It is estimated that the motor had to turn over at 1,800 revolutions per minute in order to attain the speed. The motor had the cylinders cast in two blocks of three, with all the valves placed on the same side, slightly inclined towards the combustion chamber.

The mixture was conveyed to the cylinders from the carbureter by means of a manifold bolted to the side of the motor opposite to that on which the valves are located, core-ways being cut in the cylinder casting, thereby heating the gases before being aspirated by the piston. Double distributor magneto with two sets of spark plugs were employed and the oil was fed to the various parts of the motor at a pressure of 30 pounds per square inch.

Power Fire Engines in Parade

YORK, PA., Sept. 18—The first automobile combined pump engine, chemical engine and hose wagon owned in Pennsylvania was one of the features of the large firemen's parade last Thursday in this city at the convention of the Pennsylvania State Firemen's Association. The fire apparatus is driven by a six-cylinder, 90-horsepower engine and has a speed of 60 miles an hour. The car cost \$9,000.

H. G. Louser is chief of the Lebanon fire department which has the apparatus. There were three other automobile chemical apparatuses in line, one from Hose Company No. 3, Bristol, Pa., another from the Radnor Fire Company, Wayne, Pa., and the new chemical engine of the Reliance Fire Company, West York Borough. The latter was built by the Martin Carriage Company, York, Pa., and is the first in the local fire department. There were over 100 fire companies from different parts of the State, and over 7,000 men in the parade.

Detroit Sees First Show

DETROIT, Sept. 18—A most complete and attractive automobile show is the one at the State Fair this year, opening today. Many of the local manufacturers, notably the Chalmers Motor Company and the Warren Motor Car Company, are showing their complete lines for 1912. The commercial car interests are also well represented.

One of the interesting exhibits is the Colonial electric, manufactured by the newly organized Colonial Electric Company, of this city. The car on exhibition is the first one completed and is being shown for the first time. Its distinctive features are an unusually long wheelbase and an extra width of body. It is of the five-passenger brougham type, with semi-elliptical springs forward and full elliptical in the rear. It has a bevel-gear shaft drive with full floating type rear axle and a Westinghouse motor and controller. The car is richly upholstered in dark blue broadcloth.

The new Chalmers "Thirty-six," which made its appearance about two months ago, is featured in the Chalmers exhibit. This car is shown in both fore-door touring car and fore-door pony tonneau types.

Other exhibitors are: The Annette Automobile Garage, Jackson Automobile Company, Cole Motor Sales Company, Cunningham Automobile Company, showing the Flanders electric, E-M-F "Thirty" and Flanders motorcycle; Rapid Motor Vehicle Company, Brush-Detroit Motor Company, Pratt-Carter-Sigsbee Company, Detroit Hupmobile Sales Company, Detroit Motor Wagon Company, Commerce Motor Car Company, Elmore Automobile Company, Brady Automobile Company, showing the Hudson line; Day Automobile Company, Lion Motor Sales Company, General Motors Company, Abbott-Detroit Automobile Company, Cartercar Automobile Company, Regal Automobile Company, Oakland Automobile Company, Poss Motor Company, Grant Bros. Automobile Company, Cadillac Motor Car Company, Buick Automobile Company, Overland Automobile Company, United Motor Detroit Company, showing Columbias and Maxwells; Seitz Motor Truck Company, Mitchell-Lewis Company, Flanders Manufacturing Company, Pontiac; W. A. Patterson Automobile Company, Miller Motor Car Company, Foster Motor Sales Company and the White Motor Company.

Calendar of Coming Events

Shows, Meetings, Etc.

- Sept. 25-30.....Atlantic City, N. J., Convention and Exhibition of the Carriage Builders' National Association.
- Jan. 1-5, 1912.....New York City, Grand Central Palace, Annual Show, Automobile Manufacturers' Association of America.
- Jan. 6-13.....New York City, Madison Square Garden, Twelfth Annual Show, Pleasure Car Division, Automobile Board of Trade.
- Jan. 6-20.....New York City, Madison Square Garden, Annual Show, Motor and Accessory Manufacturers.
- Jan. 10-17.....New York City, Grand Central Palace, Twelfth Annual Show, National Association of Automobile Manufacturers; also Motor and Accessory Manufacturers.
- Jan. 15-20.....New York City, Madison Square Garden, Twelfth Annual Show, Commercial Division, Automobile Board of Trade.
- Jan. 18-20.....New York City, Annual Meeting of the Society of Automobile Engineers.
- Jan. 27-Feb. 10....Chicago Coliseum, Eleventh Annual Automobile Show under the auspices of the National Association of Automobile Manufacturers. Pleasure cars, first week. Commercial vehicles, second week. Accessories, both weeks.
- March 2-9.....Boston, Mass., Tenth Annual Show, Boston Automobile Dealers' Association, Inc.

Race Meets, Runs, Hill-Climbs, Etc.

- Sept. 21-22.....San Francisco, Cal., Commercial Reliability Run, San Francisco Examiner.
- Sept. 23.....Philadelphia (Point Breeze), Track Races, Philadelphia Automobile Trade Association.
- Sept. 23-25.....Detroit, Mich., Track Races, Michigan State Agricultural Society.
- Sept. 30.....Guttenburg, N. J., Track Races.
- Sept. 30.....Bridgeton, N. J., Track Races, South Jersey Motor Club.
- Sept. 30.....Flint, Mich., Track Races.
- Oct. 6-13.....Chicago, Ill., Thousand-Mile Reliability Run, Chicago Motor Club.

- Oct. 7.....Danbury, Conn., Track Races, Danbury Agricultural Society.
- Oct. 7.....Philadelphia, Fairmount Park Road Races, Quaker City Motor Club.
- Oct. 7.....Springfield, Ill., Track Races, Springfield Automobile Club.
- Oct. 9-13.....Denver, Colo., Reliability Run, Denver Motor Club.
- Oct. 10.....Bedford, Ind., Hill Climb.
- Oct. 11.....Oklahoma City, Okla., Reliability Run, Oklahoma State Automobile Association.
- Oct. 12-13.....Peoria, Ill., Track Races, Peoria National Implement and Vehicle Show.
- Oct. 14.....Santa Monica, Cal., Road Races.
- Oct. 14 (to 25)....New York City, Start of the Annual Glidden Tour, en route for Jacksonville, Fla.
- Oct. 16-18.....Harrisburg, Pa., Reliability Run, Motor Club of Harrisburg.
- Oct. 21.....Atlanta, Ga., Track Races.
- Oct. 31.....Shreveport, La., Track Races, Shreveport Automobile Club.
- Nov. 1.....Waco, Tex., Track Races, Waco Auto Club.
- Nov. 2-4.....Philadelphia, Reliability Run, Quaker City Motor Club.
- Nov. 3-4.....Columbia, S. C., Track Races, Automobile Club of Columbia.
- Nov. 4-6.....Los Angeles-Phoenix Road Race, Maricopa Auto Club.
- Nov. 9.....Phoenix, Ariz., Track Races, Maricopa Automobile Club.
- Nov. 9, 10, 12....San Antonio, Tex., Track Races, San Antonio Auto Club.
- Nov. 27.....Savannah, Ga., Vanderbilt Cup Race, Savannah Automobile Club.
- Nov. 30.....Los Angeles, Cal., Track Races, Motordrome.
- Nov. 30.....Savannah, Ga., Grand Prize Race, Savannah Automobile Club.
- Dec. 25-26.....Los Angeles, Cal., Track Races, Motordrome.

Foreign Fixtures

- Oct. 1.....Gaillon, France, Hill-Climb.
- Oct. 12-22.....Berlin, International Automobile Exhibition.
- Nov. 3-11.....London, Eng., Olympia Show.

Expert Reports on Aluminum

WASHINGTON, D. C., Sept. 18—Not over a generation ago aluminum was little more than a curiosity. It was worth \$15 a pound and its total production in the United States was less than 100 pounds a year, notwithstanding the fact that aluminum is the most abundant of all the metals in the earth's crust, of which aluminum oxide forms about 15 per cent.

The great progress made in the industry is noted in the fact that a report on bauxite and aluminum for 1910, just published by the United States Geological Survey, shows a consumption in this country in that year of 47,734,000 pounds, valued at nearly \$12,000,000. The price has dropped from \$1 an ounce to about 23 cents a pound.

W. S. Phalen, author of the report, states that although aluminum has in recent years become a most important economic metal, it is at present produced only from bauxite, a comparatively scarce mineral, and that even the great discovery which made this possible is only the first stage of wresting the metal from its various rock and earth combinations. Aluminum is an essential constituent of all important rocks, except sandstone and limestone, and is found in all clays. The supply is therefore practically limitless, awaiting only the perfection of a process for cheap extraction.

There are a number of recently patented processes which show progress in the cheap extraction of the metal from the common sources of supply:

Colonels Must Show Double Numbers

LOUISVILLE, Sept. 18—An opinion from the Attorney-General of Kentucky has been received by the Louisville Automobile Club on the disputed question of numbers on automobile lamps. The Attorney-General quotes the last half of Section 4, Chapter 81, of the Acts of 1910, which act is entitled "An act defining motor vehicles, providing for the registration of the same and uniform rules regulating the use and speed thereof," which reads as follows:

"Upon each of the glass fronts of the two first mentioned lamps showing white lights shall be displayed in such manner as to be plainly visible when such lamps are lighted, the number of the certificate issued aforesaid by the Secretary of the State, and in addition thereto the letters 'KY,' such figures to be in separate Arabic numerals not less than 1 inch in height."

"My opinion," says the Attorney-General, "is that this section of the statute is mandatory and that every owner or person using or operating an automobile upon the public highways, streets, etc., of the State or any city must comply with the provisions of Section 4 of the act. In view of the provisions of Section 3, which seem to fully provide for the identification of the car, the requirements of Section 4 seem to be superfluous, but thus the law is written, and so long as the statute remains unrepealed, or until amended, it should be obeyed by those owning and operating automobiles."

Indianapolis Seeks City Automobiles

INDIANAPOLIS, IND., Sept. 18—After considerable deliberation, the Indianapolis Board of Public Safety has awarded contracts for four new pieces of motor fire apparatus for the fire department. These contracts are as follows:

Squad wagon, carrying eight men, 250 feet of chemical hose and 35-gallon chemical tank, Meridian Auto Company, representing Packard Motor Car Company, \$5,277.40; ladder truck, carrying 130 feet of ladders, Mais Motor Truck Company, \$4,800; combination hose and chemical wagon, \$5,000, and pump engine pumping 600 gallons of water a minute, \$7,500, to American Le France Engine Company, Elmira, N. Y.

The board of school commissioners has received the following bids on a truck for the school supply department: Mais Motor Truck Company, chassis, \$2,500; J. E. Burkhart, representing General Vehicle Company, 2,000-pound truck, \$2,700 and

\$3,390, according to batteries; 4,000-pound truck, \$3,450 and \$3,820, according to batteries.

Thomas A. Winterrowd, building inspector, has asked the Board of Public Safety to buy two gasoline runabouts for the deputy building inspectors under him. The Board of Health is asking bids on a new gasoline ambulance for the city hospital, which already has one such ambulance in service.

Motorizing Lansing's Fire Fighters

LANSING, MICH., Sept. 18—It is expected that by January 1 Lansing will have a fire department consisting almost entirely of automobile apparatus. The Board of Police and Fire Commissioners has decided to make the combination wagon at station No. 4 into an automobile combination truck. The board has taken similar action in regard to the combination wagon at station No. 3. The work will be done by the Olds Motor Works.

This will leave only one piece of horse-drawn apparatus in the whole department and that probably will be supplanted shortly.

Trunk Line Will Tap Desert Country

PORTLAND, ORE., Sept. 18—Burns, Ore., and the city of Portland are to be brought eight days nearer together, and Portland given a lever which should mean the securing of the immense central Oregon business as the result of the establishment of automobile freight truck service between the cities of Bond and Burns, Ore. The total distance over which the big freight trucks will run is 138 miles, practically all of which is over a desert country, as accessible in the Winter as in Summer.

Negotiations pending for some time between the merchants of Burns and the Central Oregon Trucking Company, of which Clifford C. Harrison, of Portland, is the head, were brought to a close the past week. Practically all of the freight received by the Burns merchants will now be routed through Bond, and thence over 138 miles of desert country into Burns.

Will Race This Week at Hartford

HARTFORD, CONN., Sept. 18—After having been indefinitely postponed, the auto races which were to have been held at Charter Oak Park September 9 and which were called off on account of a muddy track, will be held September 21, the Automobile Club of Hartford having decided to promote them.

The races were arranged by the Connecticut Fair Association as the closing feature of the State Fair held Labor Day week.

Reo Company Plans Big Production

LANSING, MICH., Sept. 18—According to General Superintendent Richard H. Scott of the Reo Motor Car Company a conservative estimate is that the production of the 1912 model will amount to 9,000 cars.

The capacity of the Reo plant is 1,000 cars a month, but that capacity cannot be reached in October, November or December. But by January the company hopes to have its raw material pushed far enough along through the various departments so that the capacity of the factory will be reached. For eight months the departments will be operated to their full extent. During some of these months it is expected the factory will exceed its normal capacity.

Insurance Company Fights Bar

DES MOINES, IA., Sept. 18—The American Fidelity Company, an insurance concern with headquarters in Montpelier, Vt., has filed suit against John Bleakly, auditor of State of Iowa, asking that the auditor be restrained from preventing the company from operating in Iowa its business of insuring automobile owners against injuries in accidents, and being made defendant in damage cases.

Tire Situation in Great Britain

AUTOMOBILE tire manufacturers in America may profit by digesting the following points relative to the motor car in the United Kingdom: First, the popularity and usefulness of and, consequently, the increased demand for taxi motor cabs are potent factors in the life of Britishers, for these taxis are rapidly taking the place of the horse-drawn hansom cab even in the remotest corners of Great Britain. This not only means more taxi-cabs and automobiles, but a corresponding increase in the demand for tires. Secondly, there is a growing market for the freight automobile throughout the United Kingdom. Third, it is evident that American automobile manufacturers are daily increasing their exertions relative to the acquirement of a share of the British motor car and tire trade. These facts have awakened the people to a sense of the really good quality of the American-made automobile and they are beginning to talk about the product in a favorable spirit. But shall they assert that the American manufacturer would sell more machines and tires if he were to emulate the trade methods of the British and even of the Continental European manufacturer and merchant, who make it the invariable rule to advertise extensively, insist strenuously upon being represented at all of the motor car shows, and to so conspicuously display their products that they shall at all times be within view of the public. Frequently, the outlay involved is prodigious, but the British manufacturer contends that expenditure of capital is imperative if he would keep in the limelight with his competitors. The same policy is incumbent upon the American manufacturer who would get his motor cars or tires before the eyes of the people. The head display agencies for British and Continental European-made cars are London and Manchester, sub-agencies being maintained in the smaller Provincial cities, such as Leeds, Liverpool, Birmingham and even Southampton. But so far as the manufacture of rubber tires is concerned, Manchester is the British center. Not alone are English firms in this line eminent, but all of the leading Continental European manufacturers of tires maintain depots in Manchester for the display of their product. While American-made tires and automobile accessories are sold to some extent in the vicinity of Manchester, none of the American manufacturers have depots there, they apparently regarding London a sufficiently near-of-access goods depot from which to supply the trade of the middle counties.

The proper way for American manufacturers to secure a share of the British tire trade would be to establish a headquarters, say, in London, where, provided a great variety of goods was displayed, orders could be filled promptly. Sub-agencies in Manchester and Liverpool might do well. But when a dealer carrying on business in a provincial town finds himself in need of automobile accessories, London is first in his mind. Therefore, local agents in towns like Leeds and Sheffield might not prove to be any material benefit to the manufacturer, except under special conditions. For example, Sheffield local dealers are supplied from the manufacturer's agent, or from the manufacturer direct with a stock sufficiently large to accommodate the trade in the immediate vicinity. Settlement is made for all goods sold at the end of each month. Twice during the twelve months an account of stock is taken. Upon these occasions slow-selling goods are exchanged at the London headquarters, the manufacturer giving ready-sale stock in its place. American-made tires are not as much in demand in Sheffield as are French and British-made tires. French manufacturers have established headquarters in London. British manufacturers are experimenting daily in order to find out if possible a tire which will run without the danger and the terrorizing effect of the side slip. And there is

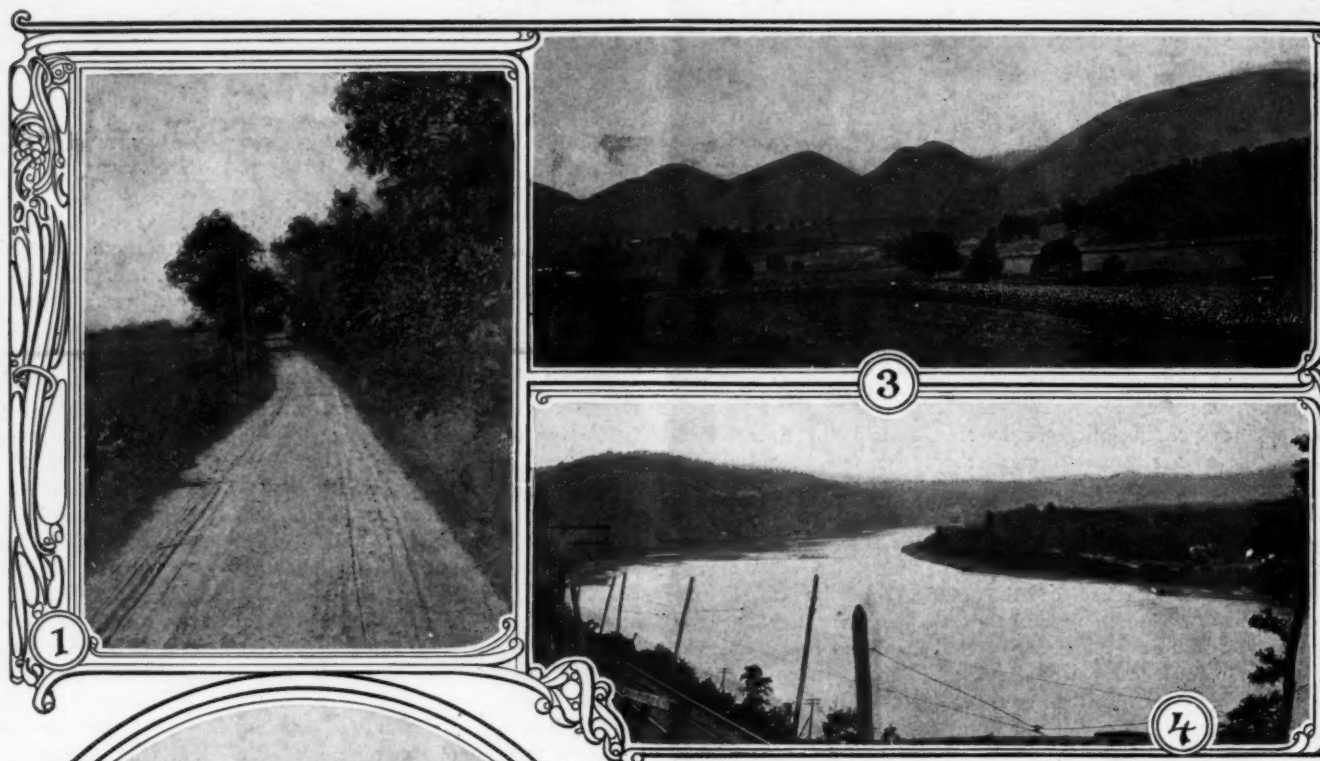
nothing that is quite as slippery as London's South American red-cedar paved streets on a dirty day. To this end a new disposition of rubber and steel is used in the tire. The finest grade of Para rubber is employed, forming a tread containing a network of the finest steel fiber, which resembles hairs. This combination produces a tread whose resiliency equals that of rubber alone, while it is also said to be practically impenetrable. It contains a non-skid surface, which causes it to adhere to the roadbed.

Discounts, as allowed by various manufacturers in Great Britain, differ considerably, ranging all the way from 10 to 50 per cent., as an inducement for pushing sales of automobiles and accessories. A rebate, in addition to the ordinary cash discount and based upon the amount of business transacted, is made at the end of the season, in the event of the terms of the contract regulating the sale price to the public not having been violated. A leading Continental European manufacturer is credited with allowing from 10 to 20 per cent. along the same lines of sale as stated.

In Edinburgh and vicinity local agents of British manufacturers of tires supply the automobile trade. Foreign manufacturing companies are represented by agents who serve in the capacity of distributors in London. Motor cars in Scotland are sold by firms who deal in automobiles and accessories. Agents handle the products of numerous manufacturers. There are nine firms in Edinburgh selling one particular type of British-made motor car tire. Commercial travelers sent out by British manufacturers are to be met with in all sections of the United Kingdom, going among dealers soliciting trade. The manufacturers supply the tires and every thirty days the stock is checked up until at the end of six months or twelve months the manufacturers take back the stale stock, replacing it with fresh goods. Catalogues contain but one price for each article listed, and upon this price to the trade all discounts are based. A 25 per cent. discount on list prices, 5 per cent. on cash sales (payment within seven days is regarded as cash) or 2 1-2 per cent. at thirty days are the prevailing terms.

Scotland has shown a kindly disposition toward French and German manufacturers of rubber tires, the sales of which are on the increase, while American-made tires also receive favorable comment, although the latter have not been as extensively displayed as the custom of the country calls for. In order to get a foothold it is necessary that goods should be placed with local agents or factors, and the terms of sale must need be quite as favorable as those which are granted by French, German and British makers, the latter controlling a goodly portion of the Scotch trade in tires, as well as in automobile accessories. The British firms expend for advertising such sums as the importance of the market warrants.

ACETYLENE LAMPS IN WINTER—Since lamps are used much less frequently in Winter than in the regular touring season, they are often neglected, the generator being left with stale or partially used carbide in the chamber, and the residue being allowed to clog up the water port and the waste ports. The rubber lamp connections and gasbag suffer also by deterioration as well as the burners and gas valves. For the proper maintenance of the system, strict cleanliness should be maintained at all times and the various parts should be examined and replaced from time to time as necessary. The results of neglect are seen every spring in lime deposits which have to be removed by means of a cold chisel, in porous connections and in clogged burners which resist the cleaning wire and necessitate the scrapping of the burners.



1—Over a stretch of fine dirt road, southward bound
 2—Scene on the Cow Pasture River, taken from bridge over the gorge
 3—The far-distant hills rise and fall like billows on the sea
 4—The winding Potomac narrows as Harper's Ferry is approached

Up the Shenandoah

WITH the approach of cool weather there seems to be a tendency on the part of the compasses of motor tourists to point southward. Although little pleasure travel has as yet headed for the extreme South, many motorists have cast an attentive eye upon the Virginias at, say, a point approximating Hot Springs.

Travelers from New York City who contemplate such a tour may well go via Morristown, Easton, Reading and so on, as is very graphically represented in the trunk line chart which is one of the unique features of the *Automobile Blue Book*. Volume 3, covering New Jersey, Pennsylvania and the Southeast, should be used on this trip.

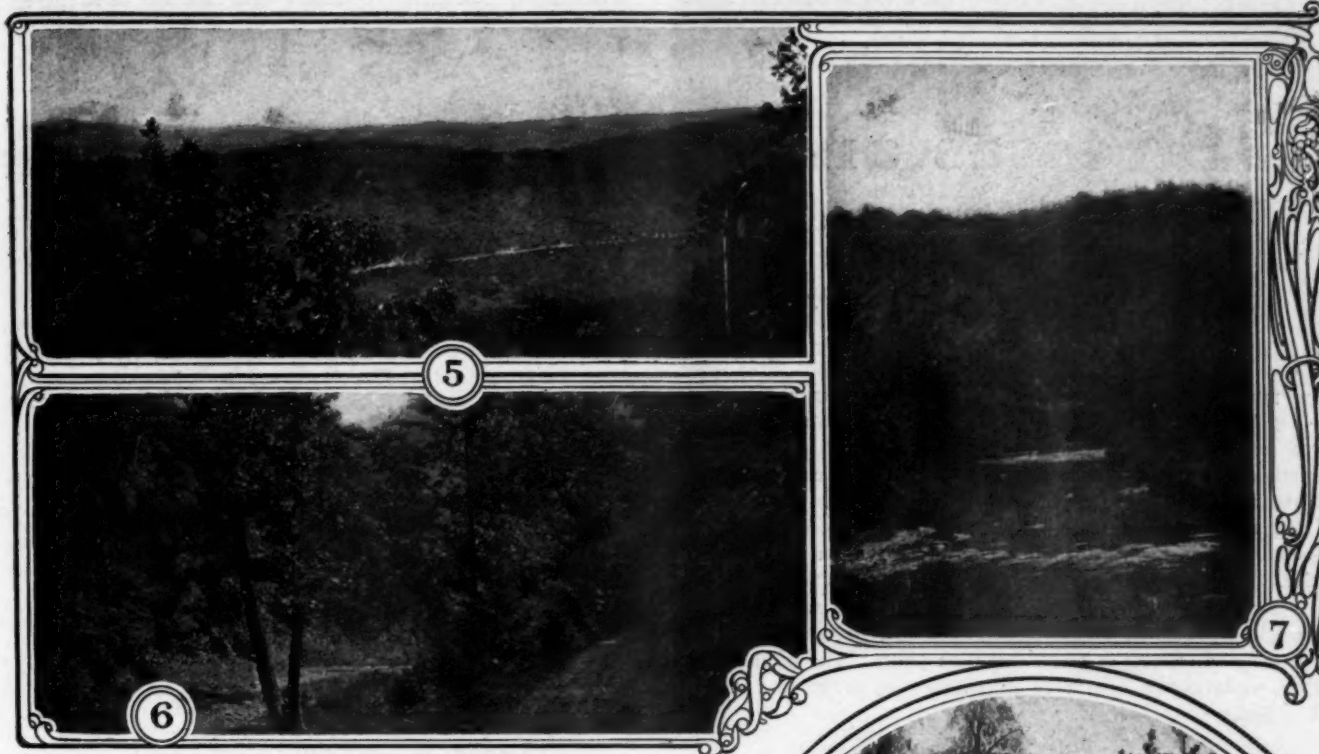
Tourists from Pittsburgh and the West may well follow the trail of the *Blue Book* official scout who went directly south from Cumberland on a very nice shale road to Monterey and then crossed the mountains on a fairly good dirt road which is being improved. The trip is delightful and the scenery such as to arouse enthusiasm. This trip is 88 miles shorter for tourists from the Pittsburgh section, who might otherwise go by way of Winchester and Staunton to Hot Springs.

Whichever way the tourist approaches the region, let him recall the fact that he traverses one of the richest fields of history in America. This statement does not apply particularly to the battlefield of Gettysburg and the many scenes of Civil War conflict. This is also the great region of colonial activity.

How true this is appears when one remembers that Philadelphia was the leading city of the country in the early days. All roads led to Philadelphia. All the colonists who started west long before Horace Greeley was alive to point the way made their exit from the coast and entrance into the great beyond by way of Lancaster and Bedford, or Cumberland and Uniontown. These places bore different names in those days. When General Braddock planned the road that bore his name, or when Forbes' Road took the all-Pennsylvania route to the strategic point of Fort Duquesne, settlements were few and far between. Indian trails fit only for pack trains were the chief "highways."

That the old "National Highway" of this section should have marked the beginning of the good roads movement in this country is also not without significance. The time is coming very shortly when this section will reassert its interest in good highways. Pennsylvania has been very devoted to the Cumberland Pike and is making considerable improvements. Virginia has evidenced an awakening in this respect also, especially in the vicinity of Richmond. The work of the Touring Club of America in connection with the American Association for Highway Improvement is already bearing fruit; and the Good Roads Congress to be held at Richmond the week of November 20-24 will focus public attention upon this very important subject.

Undoubtedly, this region will one day rival New England as an automobile touring ground. It is crowded with scenes of varied interest. Nature here is ever attractive. The coast is bordered by a wide belt of rich agricultural land. Up to the foothills



- 5—The view from Virginia Hot Springs is unsurpassed
 6—Glimpse of virgin country en route from Cumberland to Hot Springs
 7—Cow Pasture River is decidedly more glorious than its name
 8—The road from Cumberland to Hot Springs is now aglow with crimson

Valley to Hot Springs

of the mountains sweep the fields of grain; and then the vast mountain ranges rise in great billows from the Blue Ridge to the Ohio.

At the present time fords constitute one of the chief obstacles to completely satisfying motor travel in Virginia. The route to Hot Springs via Monterey, for instance, has some fords that might be bad in very wet weather. Nor can one deny that there are such well-known features as ditches and waterbars, but they are not bad. The 150 odd miles are covered on a good dirt road and the scenic delights make the trip in itself well worth taking.

From Cumberland one goes 13.1 miles to Frankfort, crossing the iron bridge over the Potomac River, 7.8 miles beyond. There are several sharp curves in the next score of miles, also several iron bridges and several small hamlets. The inhabitants of these queer places are just beginning to appreciate the increasing volume of motor travel, and, if there be any value in modern civilization, will quickly gain the polish that has already begun to shine in the small towns of the North. It is an undoubted fact that the growth of motor touring has brought many a village into the current of modern life, from which it dropped when the stage coach stopped and the railway went some other way.

Petersburg is entered on Keyser avenue. Crossing the long iron bridge, the traveler comes to a winding, hilly road from which the views are splendid. When the odometer reads 103 or thereabouts the route crosses the Virginia State line, shortly winding through the virgin woods. Monterey and Vanderpool are reached in quick succession. Monterey is 112 miles from Cumberland. Hot Springs is 36 miles beyond. At Warm Springs (143.5) one strikes a stretch of macadam, and 4 miles farther is a tollgate, which it costs a quarter to pass.

One has now reached the wonderful thermal springs, known all over the world and annually visited by many wealthy people. The valley is from 2,000 to 2,500 feet above the sea level.

The return trip to the northward should not be begun without remembering that to the south between Lexington and Roanoke is the Natural Bridge, 215 feet high, 100 feet wide and 90 feet clear span. Many prominent men before you have visited the bridge, including George Washington, who just naturally carved his name high up on the rock.

Another great natural wonder of this region is the Luray Cavern, reached over fair roads east from New Market on the route from Staunton to Winchester. It is a wonder spot rivaling the Kentucky Mammoth Cave. En route to Staunton, the tourist should take advantage of the new bridge over Cow Pasture River. As the pictures indicate, the views are very pretty, and the travel is better and 6 miles shorter. The National Highway is in fine shape to Winchester and to Hagerstown, according to official reports just received by the Touring Club of America. Road conditions in many parts of the country vary almost as the weather varies, so that the tourist should get the latest information before he starts.



Stresses and Strains in Tires

Part II.

Translation from an article by Henri Petit, in *La Technique Automobile et Aérienne*

THE warp and the woof threads in pneumatic tires are placed at an angle of approximately 45 degrees in the principal plane of the surface. As the resistance of the canvas is none other than that of the warp and the woof it is interesting to look for the resistance imposed on the threads.

In articles that have appeared on the manufacture of tires we find that the angle of the threads, which is about 90 degrees at the bead, comes down to 70 degrees at the center portion of the tire.

It is proposed to first of all calculate the tensions following the principal planes at the points A and C in Fig. 1.

Supposing the tire is cut in a meridian plane. The layers will have to withstand a resistance as follows in order to remain stuck together:

$$\frac{p \cdot \pi r^2}{2 \pi r}$$

which equals $\frac{p r}{2}$.

This is the tension in the equatorial plane which can be designated by T_E .

If we now cut the tire in the equatorial plane the force which will tend to sever the two halves will be equal to

$$p [\pi (R+r)^2 - \pi (R-r)^2]$$

that is to say,

$$4 \pi R r p$$

The tension for unity of length along the equatorial circle of the greatest radius will be:

$$T_M \text{ Min.} = \frac{4 R r \pi}{2 \times 2 \pi (R+r)} p$$

$$= \frac{R r}{R+r} p$$

and the tension for unity of length along the small circle will be:

$$T_M \text{ Max.} = \frac{4 \pi R r}{2 \times 2 \pi (R-r)} p = \frac{R r}{R-r} p$$

Let these meridian tensions be called T_M Min. and T_M Max.

Near the beads the threads of the canvas are at an angle of 45 degrees to the direction of meridian and equatorial tensions.

The tension t following these threads will be (see Fig. 2):

$$t = \frac{\sqrt{2}}{2} (T_E + T_M \text{ Max.})$$

that is,

$$t = \frac{\sqrt{2}}{2} p r \left(\frac{1}{2} + \frac{R}{R-r} \right)$$

$$= \frac{p r}{2 \sqrt{2}} \frac{3R-r}{R r}$$

At a point of the great equatorial circle where the threads form between them an angle α ($\alpha < 90^\circ$) the tension of these threads will be, according to Fig. 3,

$$T = \frac{1}{2} \left[\frac{T_M}{\cos \frac{\alpha}{2}} + \frac{T_E}{\sin \frac{\alpha}{2}} \right]$$

that is,

$$T = \frac{1}{2} p r \left[\frac{R}{R+r} \frac{1}{\cos \frac{\alpha}{2}} + \frac{1}{2 \sin \frac{\alpha}{2}} \right]$$

Let us apply these formulæ to some standard sizes of covers.

$$1^\circ 760 \times 90 \quad R = 33.5 \quad r = 4.5$$

Tension at the Bead of the Cover

$$t = \frac{5 \times 4.5}{2 \sqrt{2}} \cdot \frac{33.5 \times 3 - 4.5}{29}$$

= 26.5 kilogrammes approximately.

The tension at the running tread [angle of the threads α = about 80°].

$$t = \frac{5 \times 4.5}{2} \left[\frac{33.5}{38 \cos 40^\circ} + \frac{1}{2 \sin 40^\circ} \right]$$

$$= \text{about } 21 \text{ kilogrammes.}$$

The tension is appreciably less at the tread, as can be seen.

This explains why when a tire bursts (unless the burst is due to a cut) the tear generally takes place at the side wall. Near to the point of attachment, where the tension is greatest, the tire is reinforced by the two small layers. Generally the tire bursts just below these layers.

The tensions that have just been calculated show what is supported by the general body of canvas.

Each layer is subjected to n times less tension.

For the sake of argument we will suppose the tension on all the layers to be equal, as this is what makers strive for in making the tires.

For the example taken above of a 760×90 tire the tension is supported by at least four layers of canvas.

Near the rim the two layers must be taken into consideration as well and the total tension divided by 6.

$$\frac{26.5}{6} = 4.5 \text{ kilogrammes.}$$

Canvas of good quality should not break unless submitted to an effort of 56 kilos per square centimeter. The coefficient of security is therefore 12.

Another interesting point is at what part of a tire the work of each layer of canvas is greatest, granted that their number is variable.

Near the point B in Fig. 1 it can be seen that the tensions in the main planes are respectively.

Tension in the perpendicular plane to the meridian:

$$t = T_E$$

$$= \frac{p r}{2}$$

Tension in the meridian plane:

$$T_M = \frac{p \cdot 2\pi R \times 2r}{2 \times 2\pi R} = pr$$

The angle that the threads make being α at this point, the forces that will act upon them can be expressed by (Fig. 3)

$$T = \frac{1}{2} \left[\frac{T_M}{\cos \frac{\alpha}{2}} + \frac{T_E}{\sin \frac{\alpha}{2}} \right]$$

continuing to call T_E the tension in the main plane perpendicular to the meridian plane.

But in replacing T_M and T_E by their values

$$T = \frac{1}{2} pr \left[\frac{1}{\cos \frac{\alpha}{2}} + \frac{1}{\sin \frac{\alpha}{2}} \right]$$

The angle of the threads for the 760 X 90 tire that we have chosen is, for example, about 85 degrees.

From which the value of T :

$$T = \frac{1}{2} \times 5 \times 4.5 \left[\frac{0.737}{1} + \frac{1}{2 \times 0.676} \right] = \text{about } 22.5 \text{ kilogrammes.}$$

This tension is not much greater than that which exists at the rolling tread.

At the point B (in Fig. 1) the number of layers of canvas is only 4. The tension of each thread of the canvas has a value

$$\frac{22.5}{4} = 5.5 \text{ kilogrammes.}$$

More, therefore, than the tension of the bead.

The tension increasing when a displacement is made from B to C, it can easily be seen that the tension of each stand or thread will be maximum following along the border of the bead strip.

This is borne out by practice. When a tire bursts prematurely it generally takes place at this point

II° 820 X 120 tire $R = 35$ $r = 6$.

$$\frac{R}{r} = \text{about } 6.$$

In applying the formulæ we have:

1. Tension at the bead for the entire canvas structure ($p = 6$ kilogs.).

$$t = \frac{pr}{2\sqrt{2}} \frac{3R-r}{R-r} = 44 \text{ kilogs.}$$

which for each layer equals:

$$\frac{44}{8} = 5.5 \text{ kilogs.}$$

taking the side strip into consideration.

2. Tension at the running tread ($\alpha = 70^\circ$)

$$t = \frac{1}{2} pr \left[\frac{R}{R+r} \frac{1}{\cos \frac{\alpha}{2}} + \frac{1}{\sin \frac{\alpha}{2}} \right]$$

with

$$\begin{aligned} \frac{\alpha}{2} &= 35^\circ \\ \cos \frac{\alpha}{2} &= 0.819 \\ \sin \frac{\alpha}{2} &= 0.574 \\ t &= 34.5 \text{ kilogs.} \end{aligned}$$

3. Tension at the walls ($\alpha = 80^\circ$).

$$T = \frac{1}{2} pr \left[\frac{1}{\cos \frac{\alpha}{2}} + \frac{1}{\sin \frac{\alpha}{2}} \right]$$

with

$$\begin{aligned} \frac{\alpha}{2} &= 40^\circ \\ \cos \frac{\alpha}{2} &= 0.766 \\ \sin \frac{\alpha}{2} &= 0.643 \\ t &= 38 \text{ kilogs.} \end{aligned}$$

Which is equivalent for each thread:

$$\frac{38}{6} = 6.3 \text{ kilogs.}$$

III. 935 X 135 tire

$$R = 40 \quad r = 6.8 \quad \frac{R}{r} = 6$$

1. Tension at the bead ($p = 7$ kilogs.).

$$t = \frac{pr}{2\sqrt{2}} \frac{3R-r}{R-r} = 57 \text{ kilogs.}$$

which is equivalent for each stand $\frac{57}{9} = 6.33$ kilogs.

2. Tension at the running tread ($\alpha = 70^\circ$).

$$t = \frac{1}{2} pr \left[\frac{R}{R+r} \frac{1}{\cos \frac{\alpha}{2}} + \frac{1}{\sin \frac{\alpha}{2}} \right]$$

with

$$\begin{aligned} \frac{\alpha}{2} &= 35^\circ \\ \cos \frac{\alpha}{2} &= 0.819 \\ \sin \frac{\alpha}{2} &= 0.574 \\ t &= 45.5 \text{ kilogs.} \end{aligned}$$

3. Tension at the walls.

$$t = \frac{1}{2} pr \left[\frac{1}{\cos \frac{\alpha}{2}} + \frac{1}{\sin \frac{\alpha}{2}} \right]$$

with

$$\begin{aligned} \frac{\alpha}{2} &= 40^\circ \\ \cos \frac{\alpha}{2} &= 0.766 \\ \sin \frac{\alpha}{2} &= 0.643 \\ t &= 50.25 \text{ kilogs.} \end{aligned}$$

which for each thread equals $\frac{50.25}{7} = 7.2$ kilogs.

It will be seen from the foregoing that the tension for each thread proportionately increases with the increase in diameter of the tire. But in all cases the coefficient of security remains superior to 8.

(To be continued.)

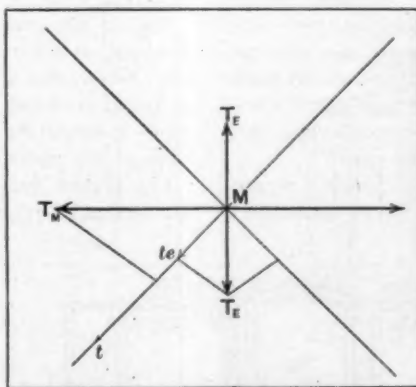


Fig. 2—Diagram showing the tension of the threads at a 45-degree angle

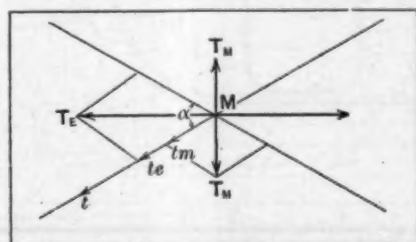


Fig. 3—Diagram showing tension of the threads at an angle less than 90 degrees

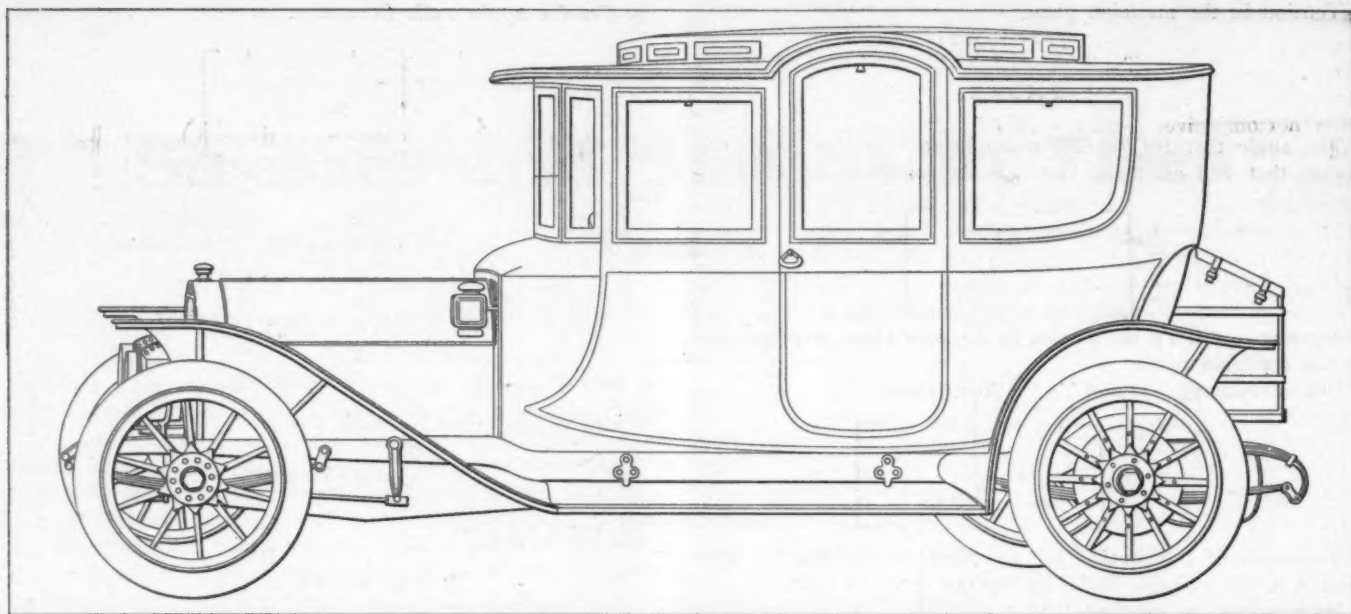


Fig. 1—Illustrating a new design of single-compartment limousine, showing generous proportions of arched door and maximum inside height

New Single Compartment Limousine

BY GEORGE J. MERCER

THE maximum amount of comfort for the occupant should seem to be the slogan of the automobile body designer, if one would form his deductions from the appearance of the new designs of bodies that are coming out for Fall and Winter use. There is a general tendency to increase the thickness of the upholstery wherever possible and particularly in the seat cushions, which are not only made thicker but are being made with more slope toward the rear. There are novelties in appointments and in trimming designs, the addition of fore doors for the protection of the driver and the low-hung chassis with the drop center that allows of low entrance way are here.

Chief among the conveniences, or more properly speaking one of the necessities of a well-designed body, is the provision made for generous door width and ease of entrance and exit. These should be such as to suit the widest range of persons, and particularly those that occupy the rear seats of the car.

Figs. 1, 2, 3, 4 and 5 illustrate a new design, single-compartment limousine, having accommodations for seven passengers

and in which the entrance way is ample and commodious. These five illustrations show a body with arched doors and ventilator dome in the roof. Both of these features have individually found favor with the public and their use collectively, as here illustrated, makes possible the maximum height for door entrance and also the maximum standing height inside the body, without distorting the body dimensions or taking from the general attractiveness of the design. The actual gain in height is $3\frac{1}{2}$ inches in this instance and it is possible to make still further gain if it were required.

Fig. 1 illustrates the body with a slight perspective and mounted on a low-center chassis, having the gasoline tank at the rear, below, and the drive is on the left side. The trunk compartment is shown at the rear of the body. Figs. 2, 3, 4 and 5 show in detail the working out of the design and the arrangement of the interior seating. The dimensions are indicated.

The arched door, which is one of the distinctive features of this design, is placed about midway of the body and there is a single entrance on each side, in line across and directly facing; this entrance gives ample and free access to the rear and the small side seats, and the entrance to the front seat is made by tilting up the right half as illustrated by dotted lines on front view, Fig. 5. In Fig. 2 is shown the back of the seat dropped down preparatory to raising the seat cushion. The back of this seat is divided in the center and either half can be made to fold down, making possible for the driver to leave by first lowering the back of his seat and then stepping over the seat to the floor at the rear. The ventilator dome is carried sufficiently forward to give the maximum walking height as far as the front of this seat.

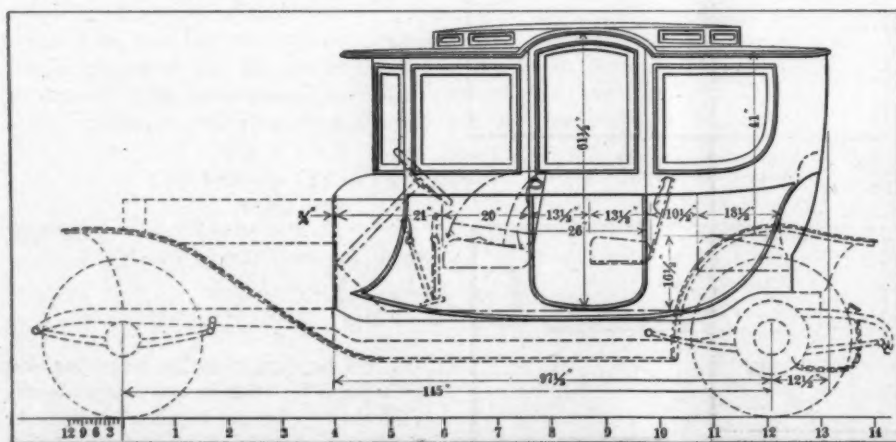


Fig. 2—Diagram showing the dimensions of single-compartment limousine body

The overall body dimensions of the design illustrated are no more than the average seven-passenger limousine, exclusive of the dome in the roof. This latter not only gives extra height inside and permits of a higher doorway, but the glass frames are made to open so that a perfect ventilation of the car is assured, without the disadvantage of a strong wind blowing onto the car occupants. For warmer weather, it is possible to entirely open up the car by dropping the glass frames in the doors and at the back and front of the doors on the sides, as well as open up the front or wind shield glass; in addition there are small screen ventilators in the dash at each side of the bonnet. The single-compartment body permits of the maximum room inside lengthwise, as the division is cut out or done away with and it also permits of a clear vision ahead for all the occupants of the car; and in the design illustrated the front corner windows are rounded slightly to better accommodate a view ahead for those seated at the rear.

Body designs, as here illustrated, are gotten up for a specific use and it is intended to be used during that part of the year when the weather is cold and disagreeable; every occupant of the car is comfortably housed and if it was desired the body could be heated from the exhaust. The trimming, the appointments and the general tone of the finish and the painting should be of the very best that money can purchase, for whereas bodies that are intended for Summer use are made to look light and attractive for the hot weather, such a design as here shown can be made to carry all the weight of luxurious fittings that the wish of the purchaser can desire.

Another feature that is becoming quite common among the owners who possess more than one car is, wherever it is practicable, to have the chassis duplicate. This has been brought about by the need of having any body fit the car that for the

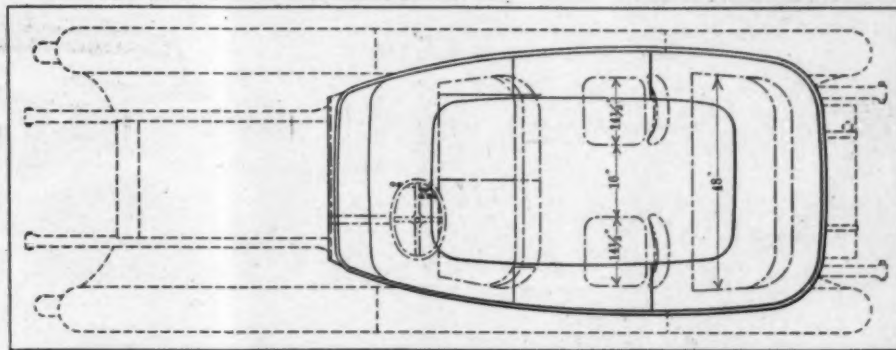


Fig. 3—Plan view showing the roomy arrangement of seats and location of steering wheel

time is in commission, and as during the early Winter and late Spring season the bodies for both Summer and Winter use are liable to be wanted, the feature of having any body fit any chassis helps to facilitate the smoothness of the running of things.

CYLINDERS REQUIRE REBORING—The metal in the cylinder walls is too soft to stand continuous service. Designers desiring, in the first place, to have the weight efficiency as high as possible take advantage of the fact that white metal is dense, hard and strong. Gray iron, on the other hand, is soft and is likely to be of varying texture. White metal in a cylinder is induced by so regulating the charge that it will take on the property technically known as "chill." This "chill" is not to a great depth in good cylinder metal, so that in order to preserve the white metal surface the finish must be restricted. It will be remembered that all finished metal is machined off, and what is wanted in completed cylinders is just enough finish to permit of making a smooth bore without cutting through the white metal coating into the gray iron texture. In the primary design of the cylinder a re-boring factor is always allowed if the bore of the motor is above 3 inches.

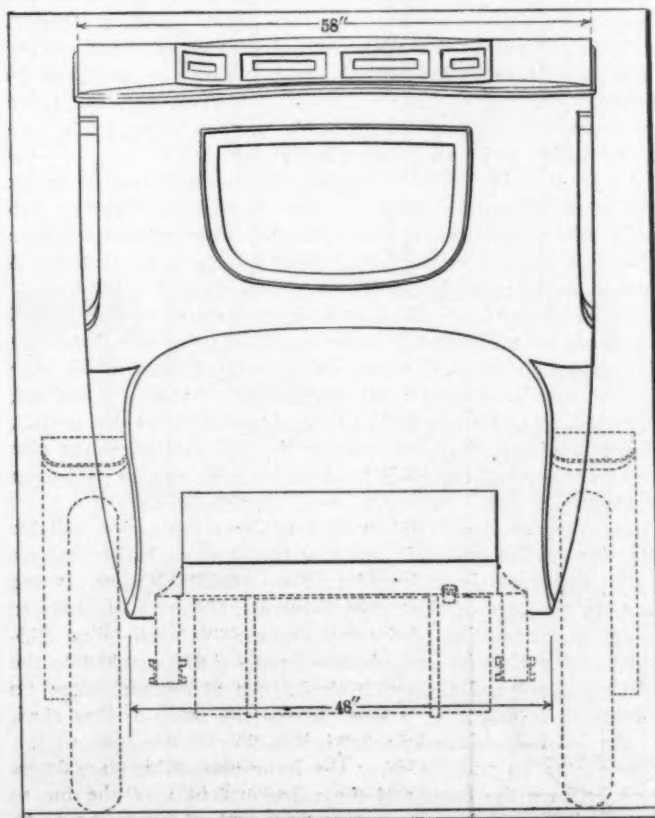


Fig. 4—Rear elevation of the new single-compartment limousine body, showing trunk

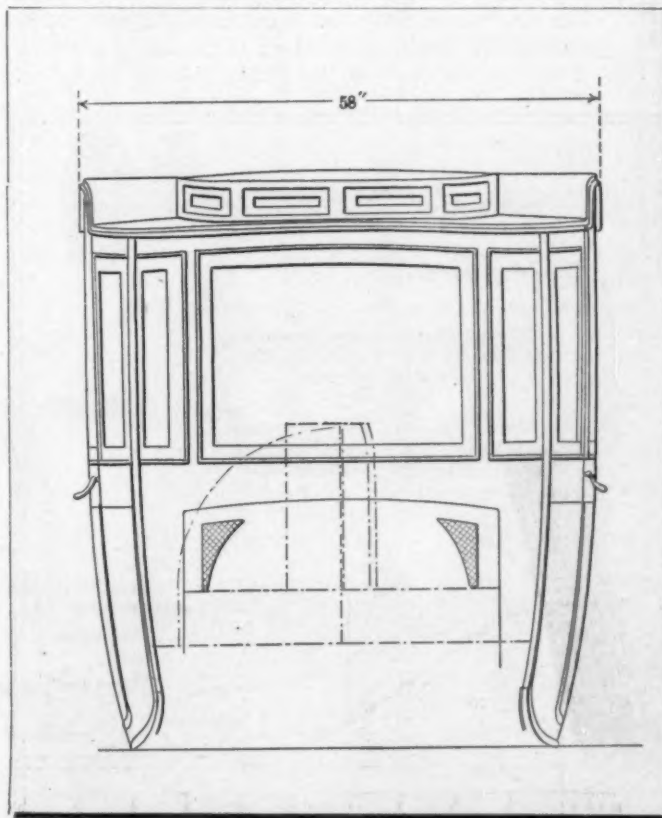


Fig. 5—Front elevation of limousine showing screen ventilators at either side of bonnet

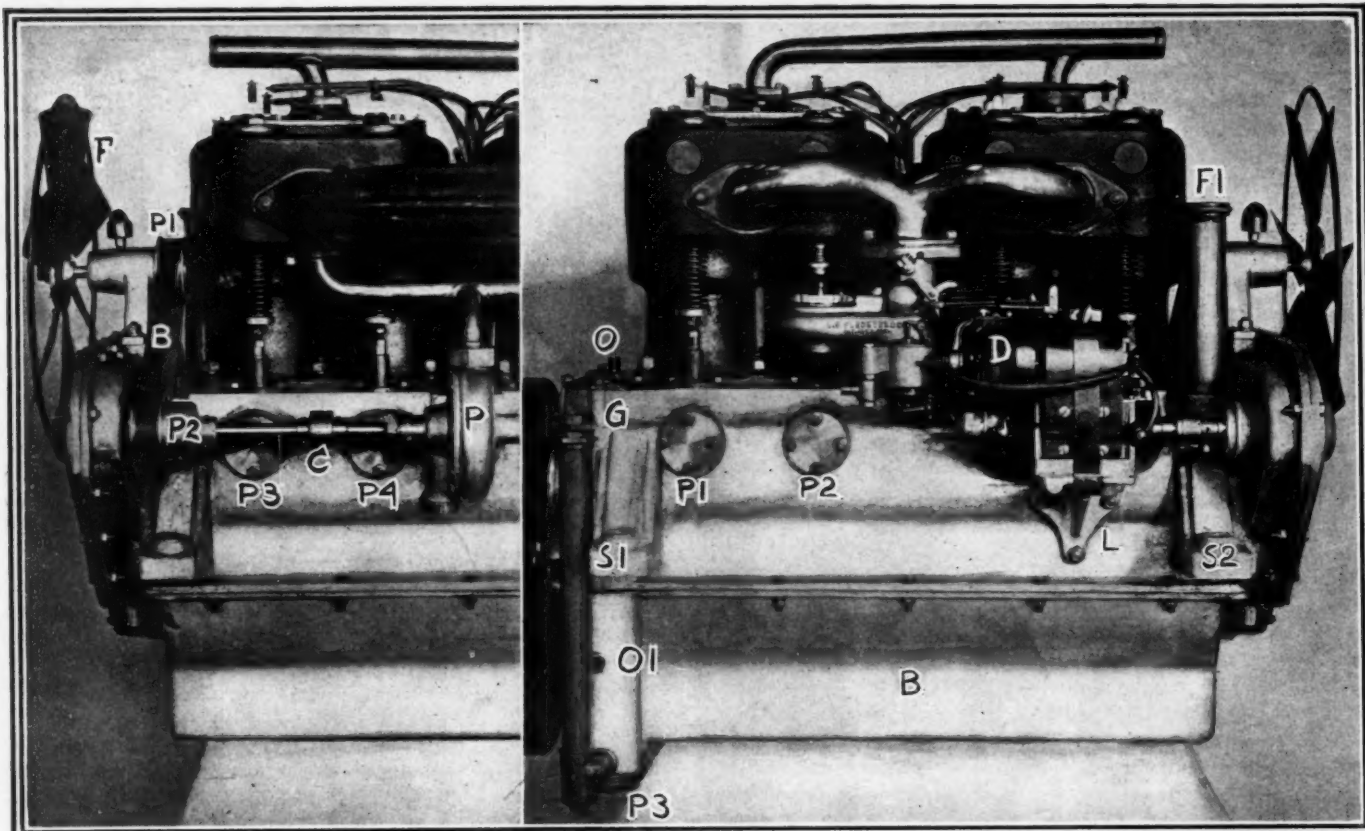


Fig. 1—Part of exhaust side of the Mercer motor

Fig. 2—Intake side of motor, showing the carbureter and double distributor magneto

Mercer Thirty-five in Detail

THE leader of the coming season's line of Mercer cars, which are manufactured in Trenton, N. J., will be the 35-horsepower model. The motor of this model is shown in Figs. 1 and 2. Fig. 2 shows the intake side of the motor,

which is of the four-cylinder, four-cycle type, with cylinders cast in pairs. The valves are located on either side of the motor, the cylinders being cast with T-heads. The diameter of the intake valve is 2 inches, and the seat is given an angle of 45 degrees. The valves have a lift of 7-16 inch, and the valve setting can be seen by referring to Fig. 7. The motor has a bore of 4.3-8 inches and a stroke of 5 inches.

The ignition is furnished to two independent sets of spark plugs from a magneto with a double distributor, whereby two sparks take place simultaneously in the firing cylinder. Fig. 2 shows the magneto in position, resting upon a ledge L which is attached to the upper half of the base chamber by three bolts.

The carbureter is of the float-feed, constant-level type, bolted to a flange of a bifurcated intake manifold; the air adjustment has been simplified so as to give a separate adjustment for high and low speeds. Fig. 2 also shows the two arms S1 and S2, which rest on and are bolted to a sub-frame of the main chassis. Oil is poured into the base chamber through the large vent pipe F1 and the level of the oil in the base chamber can be read upon the gauge G.

The water cooling is taken care of by means of a cellular radiator placed in front of the motor supported on ball trunnions, whence the water is delivered to the centrifugal pump P and thence to the base of the exhaust valve chambers. In order to render the dismantling of the pump as easy as possible, an Oldham coupling C is interposed between the shaft attached to the half-time gears and the pump shaft. An aluminum pulley P2 is attached by means of a taper pin to the pump-driving shaft and the fan F is driven by a flat belt B through the pulley P1.

The plates P3 and P4 carry the lever arms which are interposed between the cams and the valve pushrods. Referring to Fig. 14, the internal arrangements to operate the valves may be seen. The arms of the plate P1 carry the pivot pin A1 upon which the arm A2 reciprocates. The lower part of the slipper

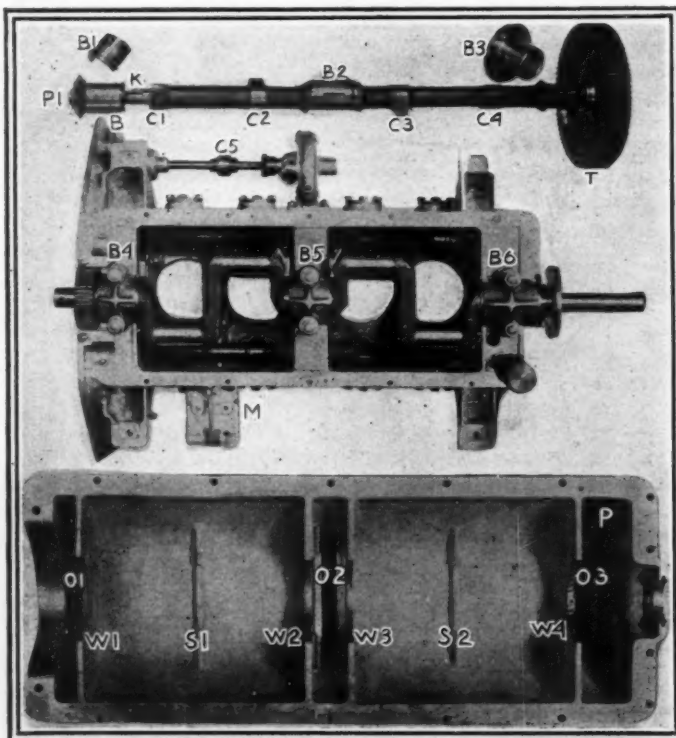


Fig. 3—Showing the base chamber and its components

S3 rides the cam, and the part S4 contacts with the pushrod R1. This is fitted at its upper extremity with a means of adjusting the lift of the valves, and in order to maintain the rod R1 stationary for this operation, flats are cut upon it at F. The nuts N1 and N2 form the adjustment.

Fig. 6 shows the method employed in securing the connecting rod to the hollow wrist pin. The connecting rod is made in the shape of an H instead of the conventional I-section, as may be seen from Fig. 14, which also shows the piston P, which is fitted with four concentric rings, all placed at the upper extremity. The lower part of the piston has a clearance between it and the cylinder of 0.008 of an inch, while the part situated above the top ring is given a clearance of 0.015 of an inch.

The crankshaft is carried on three main bearings, B4, B5 and B6, shown in Fig. 3, the lower caps of the bearings being held in position by 12-inch bolts which pass through the upper half of the base chamber. The timing gear T attached to the camshaft has a 11-4-inch face, the teeth being cut with a shaper. The camshaft is stamped integral with the cams C1, C2, C3, C4 from 7 per cent. carbon steel, which is annealed and hardened, the cams being ground to size. It runs on three main bearings B1, B2, B3 and the rear extremity is fitted with a key K which engages the collar carrying the pinion P1. The bearings B1 and B2 are split and lined with anti-friction metal.

The oiling system of the Mercer car has been carefully thought out and has been found to be most efficacious. In short, it is a combination of pump-feed and splash. Fig. 3 shows the lower half of the base-chamber, in which there are two compartments subdivided by the separators S1 and S2, forming troughs into which the lower half of the connecting rods dip. The oil that is carried in the sump shown at O1,

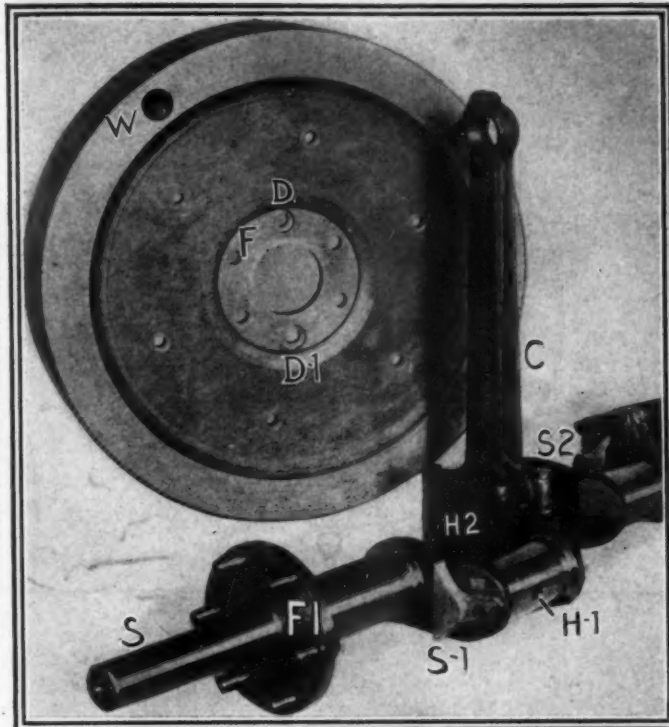


Fig. 5—Showing part of the crankshaft, together with oil cups and flywheel O2 and O3, extending the whole length of the base-chamber, is taken by a pump and delivered to the three main bearings

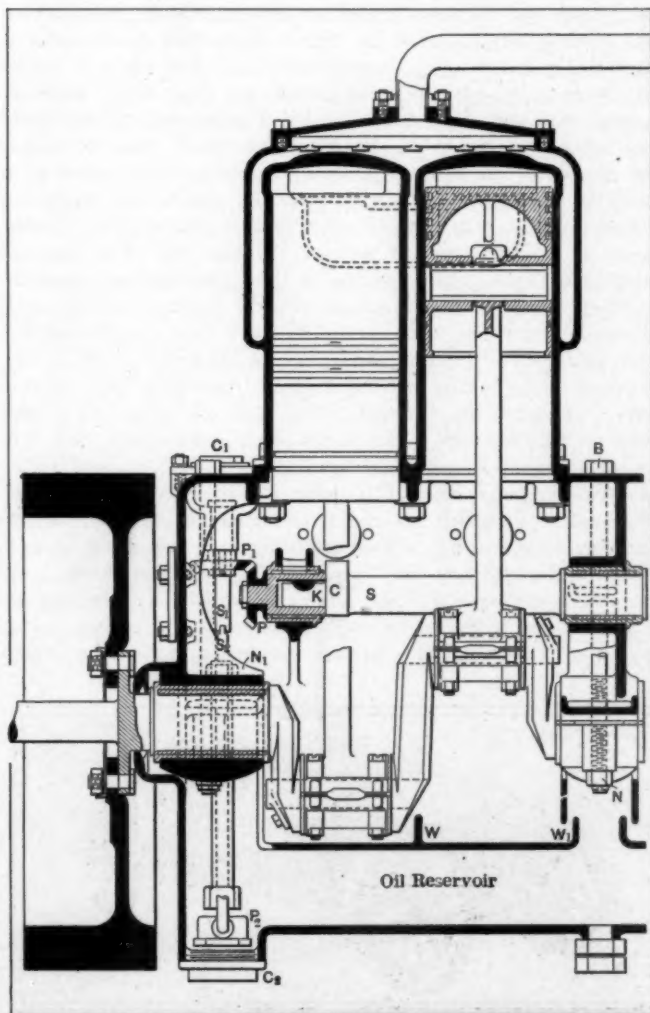


Fig. 4—Section of two rear cylinders, showing cam and crankshafts

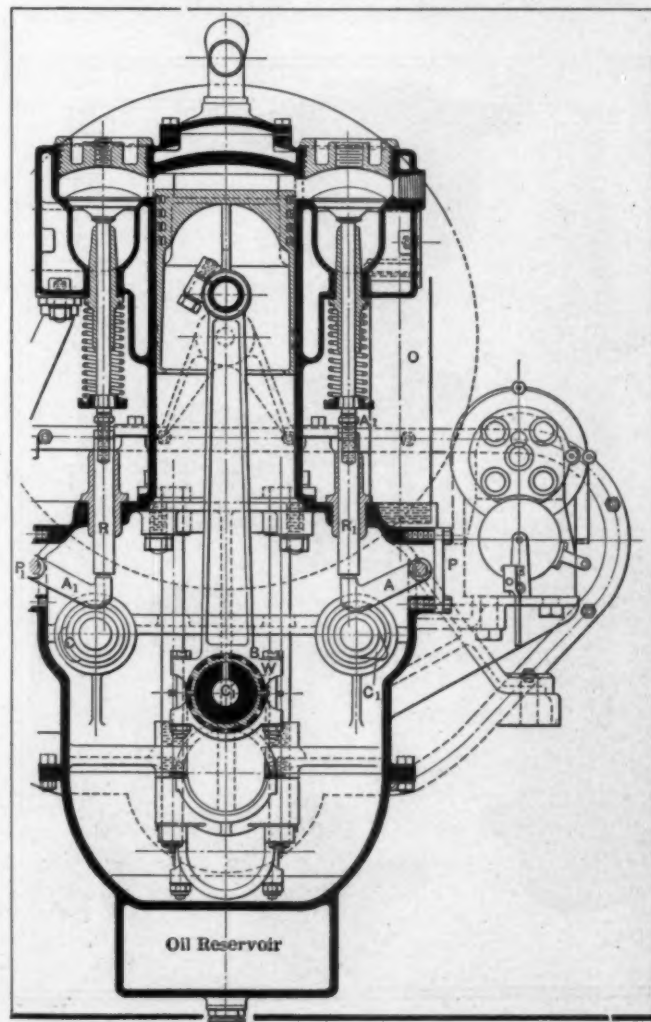


Fig. 6—Transverse section of the third cylinder of the motor

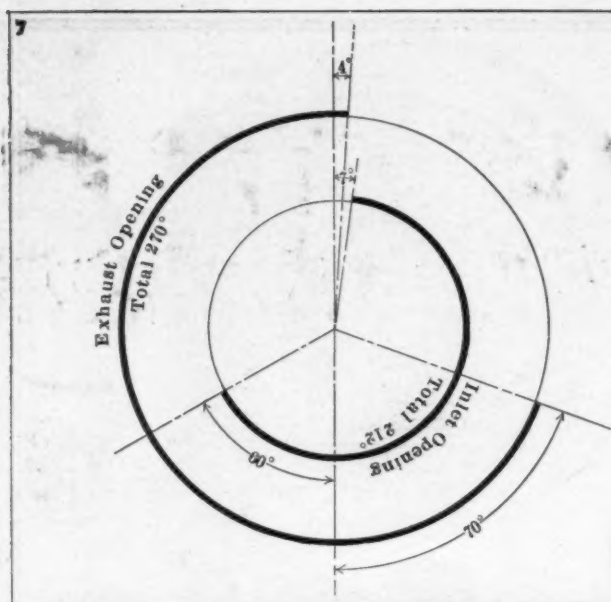


Fig. 7—Timing diagram of the Mercer motor, showing valve openings.

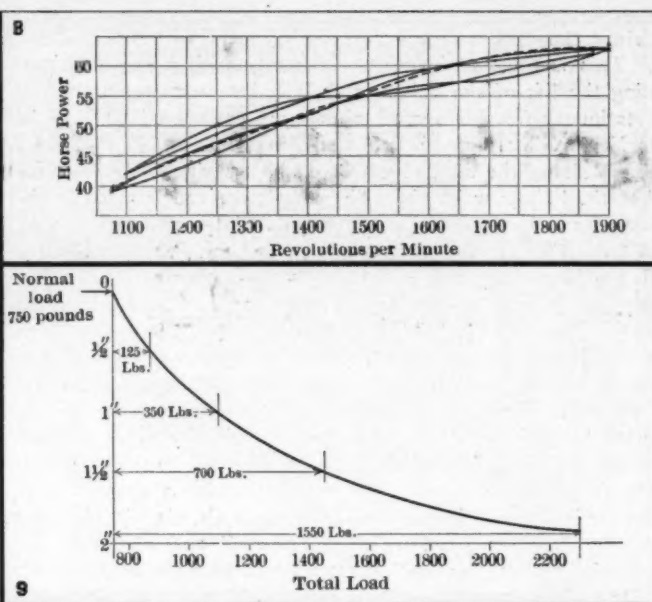


Fig. 8—Horsepower curves of five Mercer motors taken indiscriminately.

of the motor. As the crankpins are drilled hollow, as shown at H2 in Fig. 5, the oil that is delivered to the main bearings is thrown out of the extremities of the bearings by centrifugal force into the cups S1 and S2. The oil then passes through the hollow crankshaft out into the big-end connecting rod bearings by the hole H1. The shims that are interposed between the two halves of the big-end bearings are wide enough to allow of sufficient gap between the upper and

lower caps. The connecting rods strike into the oil in the troughs beneath them, thereby lubricating the cylinders, pistons and wristpins, as well as the camshaft bearings. As soon as the oil in these troughs reaches a certain level it overflows into the sump.

The details of the pump may be seen by referring to Fig. 10. The cap C is bolted into the upper half of the base-chamber and carries the shaft to which the bevel pinion P1 is attached. This meshes with a pinion P2, which is attached to the exhaust camshaft in the manner shown in Fig. 3. The shaft S has a slot cut in it in order to accommodate the tongue T3, which is integral with the shaft S1. The lower extremity of the shaft also has a slot cut in it, T2, in which the U-piece R slides. The pin P on the cap C1, placed slightly eccentric thereto, is placed in the hollow of the U-piece R, and as the shaft S1 rotates inside of the body B1 the part R carries the oil that enters at I and forces it out of the exit O. The general assembly of the pump is shown at the left, a gauze screen S encircling the base of the pump, thereby filtering the oil and preventing impurities from being returned into the circulation.

An auxiliary oil tank is provided and oil is delivered to the base-chamber by means of a hand pump when required. On the dash is a sight-feed through which the oil from the pump passes to the bearings. This is of such construction that the flow may readily be seen.

A new design of gearset is being incorporated in next season's models, in which the clutch and gears are housed in the same aluminum casting, located amidships and bolted to the extension of the subframe that carries the motor. The clutch is of the multiple-disc type and the service brake, which is located at the rear of the transmission, has a diameter of 10 inches and a width of 3 inches. The friction surfaces are cast-iron shoes

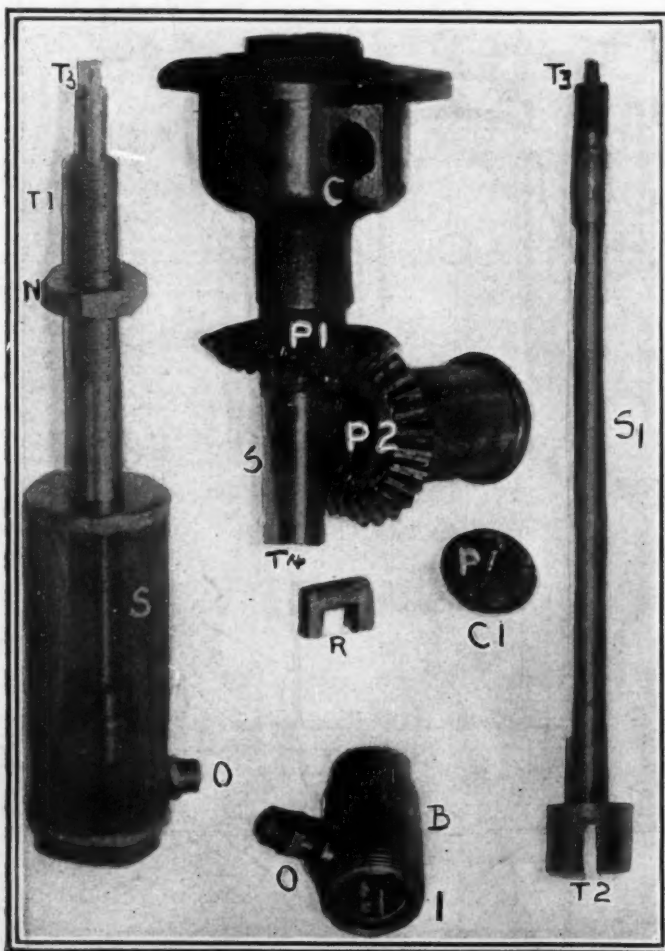


Fig. 10—Complete and detail assembly of the oil pump

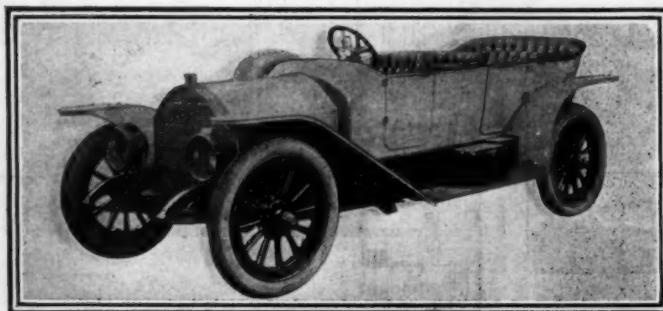


Fig. 11—General appearance of the Mercer fore-door torpedo

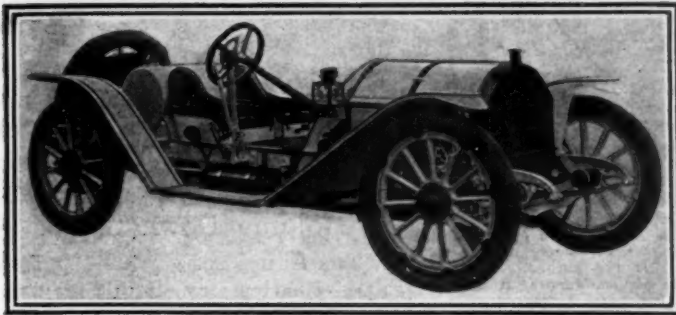


Fig. 12—Mercer raceabout, showing method of carrying gasoline tank and tires

to the steel drum. Three speeds forward and one reverse are furnished on the raceabout and runabout while four speeds forward and one reverse are fitted in the case of the four or five-passenger cars.

The general scheme of the live rear axle may be seen by referring to Fig. 12. The housing is formed by two pressed steel members welded together and the tubes T, which carry the weight of the load, are swedged into the main body and afterward riveted as an extra security. The shaft S, which is connected to the propeller shaft by means of a universal joint, is carried on two annular ball bearings and the end thrust is taken care of by the thrust bearings T2 and T3. The housing H1, to which the crown wheel is bolted, is carried on annular ball bearings, side-thrust bearings being employed as well. A torque member is attached at T1, which is part of the front end of the casing.

The rear cover of the differential casing is removable and after the live rear axle shafts have been sufficiently withdrawn it is possible to remove the differential unit. The wheel hubs are fitted with two annular ball bearings which slip over the tube T and are locked in position by means of the ring R, and the dogs at the ends of the shafts fit into corresponding slots in the hub. The driving member is attached to the ends of the shafts upon four keyways cut therein, but the ends that fit into the differential body are squared. The interior of the emergency brake may also be seen in Fig. 12. The drum is 14 inches in diameter, 2 inches wide, the shoes being faced with asbestos fabric liners.

The suspension of the raceabout and runabout is taken of

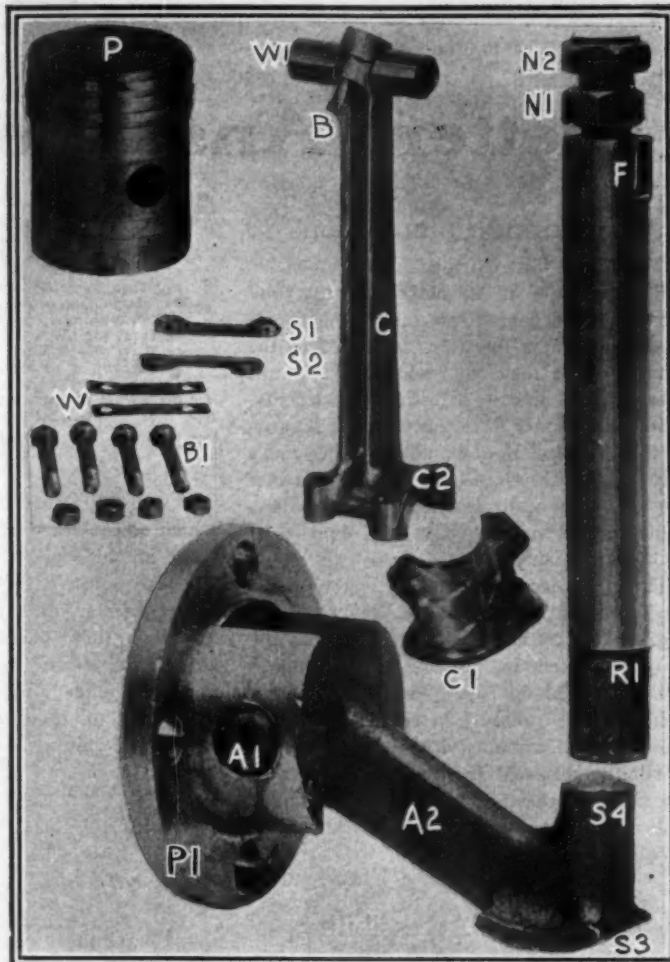


Fig. 14—Showing the piston-connecting rod assembly, also valve operating parts

semi-elliptic springs all around, but the touring cars have three-quarter-elliptic springs at the rear. Fig. 9 shows the degrees of deflection of the springs for various loads, and it will be seen that as the weight increases the deflection decreases.

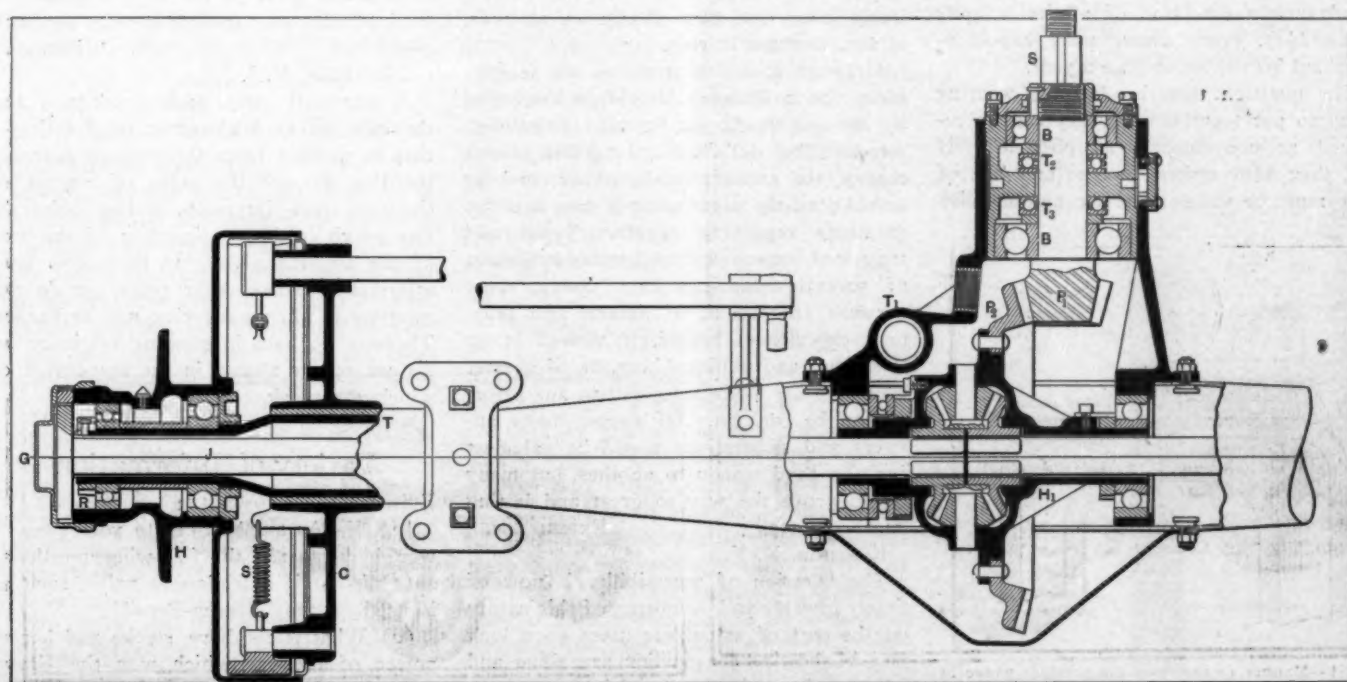


Fig. 13—Sectional view through rear axle, showing differential, driving wheel and driving shaft ball-bearing supports

Letters Answered and Discussed

Measuring Compression

EDITOR THE AUTOMOBILE:

[2,832]—As a subscriber to your valued paper I am taking the liberty of asking you a question in regard to the measuring of the compression of a motor. I have tried in vain to estimate it by various means and have not obtained satisfactory results. You would be doing me a great favor if you would let me know if there is any accurate means of measurement and, if there is, how it is done.

Oakdale, Cal.

JAS. CARLTON.

The compression may be accurately measured by attaching a gauge as shown in Fig. 1. The spark plug is removed and the gauge screwed in position. The engine is then turned up slowly against compression and the pressure noted. Cold compression as determined in this manner will be slightly different from the running compression, as the pressure in the cylinder will not be atmospheric when the engine is operating with fuel.

Believes in Accessibility

EDITOR THE AUTOMOBILE:

[2,833]—I have just been reading your editorial on the subject of accessibility and an accessibility contest, and I heartily agree with everything you have said. As I understand, and believe, automobiles are and must be for the people and general use, and therefore, unless they are to be run and thrown away at the end of each year (and such a condition of affairs is quite impossible), every owner must expect to overhaul his car about once a year.

The question then is, Are the wearing parts so put together that they can be replaced as conveniently as possible? If not, then unnecessary expense and loss of time must be the part of the automobilist.

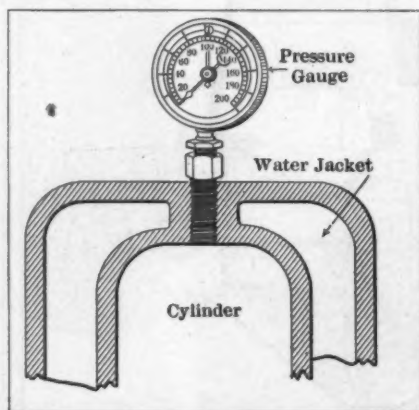


Fig. 1—Manner of inserting the pressure gauge in spark-plug hole to measure compression

The Editor invites subscribers to communicate their automobile troubles and personal experiences, stating them clearly on one side of the paper. If the nature of the case permits, send a sketch, even if it be rough, in order to assist to a clearer understanding. Each communication will receive attention in the order of its receipt, if the writer's signature and address accompany it as an evidence of good faith. If the writer objects to the publication of his name, he may add a nom de plume.



Besides this there are many adjustments which must, for one cause or another, be made on the road.

I also agree with you regarding designing engineers. If a yearly contest was had in which they, personally, were to drive, adjust and repair over a route, say, one thousand miles long, it would show them the error of their ways in hundreds of cases, and might, if they were willing to

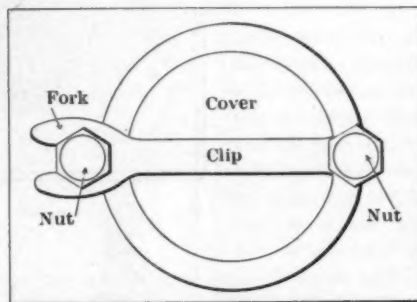


Fig. 2—Clip placed over screw cap to prevent it from falling off when subjected to vibration

accept the suggestions, result in making many cars what they should be, at little, if any, increase in cost.

It seems to the writer that the leading ideas for a designer should be suggested by the initials D. A. R., viz.: Durability, Accessibility, Reliability. I further believe that if the manufacturers of automobiles would send the users of their cars a set of questions regarding apparent faults and suggested improvements (as the publishers of several magazines have done), these answers (the result of natural and practical experience) would, if viewed in an intelligent and unbiased way, be of greater benefit to the manufacturer than any information he can get. Of course many answers and suggestions would be valueless for one good reason or another, but many would prove the way to great and lasting improvements.

EXPERIENCE.

Kingston, N. Y.

The question of accessibility is now of timely interest and comments of this nature on the part of actual car users go a long way in showing the opinion prevailing and are therefore of exceptional interest.

Holding Down Cap

EDITOR THE AUTOMOBILE:

[2,834]—I have a screw cap on the gasoline tank of my car which is continually jarring loose. After running about 50 or 60 miles the cover will fall off owing to the vibration of the car. Is there any way that you know of to remedy this? I would greatly appreciate an answer at an early date in your letter columns.

ED. MURPHY.

Mt. Vernon, N. Y.

A handy way of stopping trouble of this nature is to take a brass clip of the shape shown in Fig. 2. Two bolts are passed through the tank as shown and held by means of nuts on the inside and the outside of the tank. The clip is then placed over the bolts and another nut (preferably winged) placed over the top in such a manner that the clip is held tightly to the cap.

Steering Knuckle

EDITOR THE AUTOMOBILE:

[2,835]—As a subscriber to your magazine I would like information on the following point: I recently saw a 1912 car of a prominent make on which the front axle, instead of being square with the floor on which the machine rested, was slightly inclined forward at the bottom so that the bottom bearing of the steering knuckle was very perceptibly in advance of the upper bearing. What is the reason for this? Will a car steer better if the knuckle is inclined that way than if it were perfectly plumb?

R. O. BOGART.

Pluckamin, N. J.

A car will steer easiest when a line through the vertical center of the tires—that is, passing from the topmost point of the tire through the point of contact of tire and road—intersects at that point the line which is the continuation of the axis of the steering pivot. If these two lines intersect at some other point, or do not intersect at all, the steering will be harder. There is no gain in steering efficiency, so far as we are aware, in the suspension of which you speak.

Variety of Information

EDITOR THE AUTOMOBILE:

[2,836]—As a subscriber to your paper I would like to ask the following questions:

(1) What is a triple-seat valve, such as is used on the "Blitzen-Benz"?

(2) What is the bore, stroke and horsepower of the car which won the Grand Prize in 1910?

(3) I have heard that a carbureter will work very well with a car of one make, while with another it will perform very poorly. If this is so, kindly tell me the reason.

SUBSCRIBER.

N. Y. City.

(1) A triple-seat valve is one in which the seat, instead of having one angle of seating, has three, which intersect each other at the valve seat.

(2) Bore, 155; stroke, 200 mm.; horsepower by American rating, 63; by makers' rating, 120.

(3) The different types of manifolds used on cars of different makes require a change of adjustment in the carbureter when it is shifted from one car to another. The carbureter itself should work just as well on one car as another provided it is of adequate size for either car. A large high-powered car will require a larger carbureter than that used on smaller motors.

No Scoop Necessary

Editor THE AUTOMOBILE:

[2,837]—My motor is lubricated by means of the splash system—that is, the connecting rods dip into the oil. There is no scoop on the bottom of the rod and I am not sure that it has not been left off by mistake, as a friend of mine has a machine which is lubricated in the same manner and he has a sort of copper spoon on the part of the rod which splashes into the oil. Is this fitting necessary? I would esteem a reply through your columns a great favor.

CHAS. COFFEY.

Tarrytown, N. Y.

The scoop is not necessary, as there are several cars using the splash system which are without it. There is generally a hole in the bottom of the connecting rod in which the oil is caught up and thrown over the cylinder when the scoop is not fitted.

Oil Leaks from Crankcase

Editor THE AUTOMOBILE:

[2,838]—My car has the oil reservoir in the base casting, and since there seems to be a space between the flanges of the two parts of the crankcase casting the oil leaks through and runs down the side of the base chamber. Would you kindly tell me how to stop the waste of oil? I do not mind the small amount of oil wasted so much as the dirty appearance of the motor on account of the leakage.

E. H. S.

Clarkesville, Tenn.

Take out the bolts which hold the upper and lower parts of the crankcase together and with a V-chisel cut a groove along the flange to take the packing, as illustrated in Fig. 4.

The bolts are tightened up after the packing, consisting of lead wire, has been put in place. When the bolts are tightened the lead will be squeezed into the groove and effectually stop any leakage.

Wedging Up Car

Editor THE AUTOMOBILE:

[2,839]—I have a very small car which I use for going about the country on business calls. Several times I have been obliged to stop on account of tire trouble and have been caught without a jack. The last time I tried to wedge the car off the ground, but found that the wedge would not slip along the rubber shoe. I have written you to find if there is any simple way of lifting the car without the aid of a jack.

TROUBLED.

Vandalia, Ill.

It seems in a case of this nature the best advice is to carry a jack, as such a tool is usually very small and compact. If it becomes necessary on some occasion to wedge the car from the ground, it is useless to attempt to drive a wedge beneath one of the wheels. Two wedges and a plank should be used as is shown in Fig. 3. The plank is laid upon the ground with one of the wedges upon it. The car is then run or pushed upon the plank and rolled up the wedge for a short distance. Before the car can roll back the other wedge is laid upon the first, between that and the wheel.

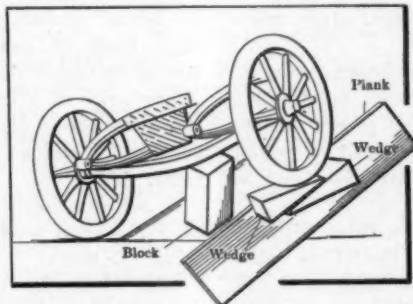


Fig. 3—Sketch showing the manner of placing wedges beneath wheels of automobile

The car will then take up the position shown in the illustration. The lower wedge may be driven in a little way to lift the wheel still higher. A block of wood is then inserted as shown and the wedges withdrawn to allow of the work being carried on. In lowering the car the wedges are replaced and hammered out gradually, thus allowing the car to be placed upon the ground without jar.

"Waterlogged" Float

Editor THE AUTOMOBILE:

[2,840]—For some time I was very much troubled by getting too rich a mixture at low speeds. This trouble kept getting worse until finally the motor could not be operated at all without getting a cloud of smoke and a large amount of carbon deposit on the cylinder walls. After attempting to remedy the trouble by making various adjustments on the carbureter and grinding the needle valve, which I strongly suspected to be the source of trouble when I first started to examine it, I have come to the conclusion that the cork float is soaked

full of gasoline and has lost all its buoyancy.

How do you go about remedying a trouble of this nature? Is it necessary to buy a new float, or can I repair it at home? I have a garage which is very well fitted up with the various tools.

AMATEUR REPAIRMAN.

Bath, Me.

In a case of this nature it is not necessary to buy a new float or even send the carbureter out to be repaired, as it may be very easily fixed at home. The float is removed and placed in an oven which is not too hot, and allowed to remain there until thoroughly dried out. It is then removed and given a coat of shellac and one of thin varnish.

Regarding Air Compressors

Editor THE AUTOMOBILE:

[2,841]—Would you kindly answer the following questions:

(1) What percentage of piston displacement will a 6-inch x 3-inch air compressor have if the compression space is ten cubic inches and the machine runs at 500, 1,000, 1,500, 2,000 and 3,000 revolutions per minute?

(2) What percentage of piston displacement with a 3-inch x 3-inch compressor having a port 3-8 inch x 4 1-2 inches opened by the piston at the bottom of the stroke, the air being drawn in through a 1 1-2-inch pipe 18 inches long, running at the same speeds as the above?

W. M. BAUMHECKLE.

Cincinnati, O.

(1) The compression space will be 23.6 per cent. of the piston displacement. The piston speed does not affect this quantity.

(2) In order to determine the percentage of the compression space the volume of the same must be known, or, in designing a compressor, the desired compression must be ascertained.

It is difficult to calculate the volume of the compression space in some instances owing to the pockets and irregular valve openings.

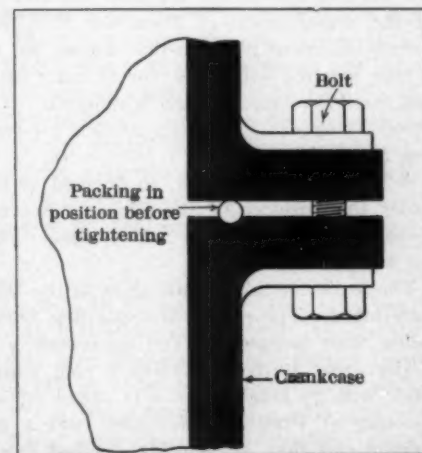


Fig. 4—How packing is placed to prevent leakage of oil from the crankcase

My 1912 Automobile

A Conception of What the Ideal Car Should Be

EDITOR THE AUTOMOBILE:

My conception of an ideal automobile is as follows: Price \$2,500, fully equipped with top, glass front, two extra tires on demountable rims, either Dorian or Firestone Q. D., and with some kind of power pump for blowing up the tires.

The wheelbase should be 114 inches, with 56 inches tread and the car should comfortably seat five. The wheels should be 36 inches and the tires 4½ inches. Bearings should be roller for the wheels, babbitt for the engine and ball bearings in the transmission.

The transmission should give four forward speeds and reverse. The gear ratios should be approximately 12 to 1 on low and reverse; 7 to 1 on second; 4 to 1 on third and 3 to 1 on high. Direct gear should be on the third speed. This gearing, although very low for the third speed, would enable one to handle the car easily at slow speeds in the city, over the majority of roads and over hills without gear changing.

Steering should be by irreversible worm and sector gear.

Motor should be 4½ bore by 6-inch stroke, 4 cylinders T-shaped, cast separately, with 2¾-inch poppet valves, with lifts fixed so as to be adjustable.

Radiator should be on dash, with thermo-syphon system. This protects the radiator from strains and allows good water circulation without a pump. Radiator can be placed higher without interfering with view of driver. Fan should be bolted on flywheel edge. Hood should be of sloping type and it should be made practically dust-tight when closed.

The crankcase bottom should be removable without disturbing the crankshaft and all engine bearings should be then easily adjusted. The case should be tight so no dust could get

to the engine, thereby doing away with usually inaccessible dust-pans.

Brakes should all be contracting, emergency on wide drums on rear wheels and foot brake on a very wide drum on the propeller shaft, all to be designed to adjust readily without tools.

Clutch should be multiple disc running in oil; about 60 plates should be used.

Ignition by magneto arranged so that it also charges a storage battery which furnishes current for lights and for auxiliary system.

Carbureter should be best actuated by throttle on wheel and foot control also, while the needle valve or the auxiliary air valve should be adjustable from the driver's seat.

Weight of car would probably be about 3,000 lbs. Road clearance ought to be about one foot.

Springs ought to be long and limber, with straps and rubber bumpers to prevent spring breakage.

Lubrication should be by splash from oil trough, oil reservoir to be in crankcase base. Oil should circulate through two sight feeds on dash and should be by two pumps, so if one became disabled the car would still be properly lubricated.

The price of a car such as above described might be brought down to about \$2,200 and would give one an all-around car capable of going anywhere and easily handled in congested traffic.

A self-starting device similar to the one used by cars now on the market would be appreciated by the majority of people using machines.

MARTIN J. D. ALBERTSON.

Glen Head, N. Y.

Harking Back a Decade

IN the issue of *The Motor Review*, September 19, 1901, the following items of interest to motordom appeared:

Secretary S. M. Butler, of the Automobile Club of America, has issued an order from the Board of Governors of the organization abandoning the scheduled Erie-Buffalo road race, the week of sports and the one-mile record race, all on account of the assassination of President McKinley.

Announcement is made that among the chauffeurs entered for a race meeting scheduled for October 10 at Providence, R. I., are the following: W. K. Vanderbilt, Jr., Foxhall Keene and Henri Fournier. Cups were offered for electric, steam and gasoline automobiles.

A big automobile show, to be held at the Coliseum, Chicago, under the auspices of the Chicago Automobile Club, has been given dates from March 1 to 8, 1902. The big West is thirsty for automobiles.

The projected automobile show at the Wisconsin Fair failed to materialize. The excuse is made that horses are an older institution than automobiles and consequently more popular.

The great Buffalo Endurance run, which started from New York with 79 entries, and was called off at Rochester after the shooting of President McKinley, was a great success. It was pointed out that 41 vehicles reached Rochester; thus only 38 fell out en route. The daily mileage was less than 80 and repairs and replacements within controls were allowed. Secretary Butler

followed the column from place to place by train so as to insure reaching the night controls.—*Editorial*.

"A foot-pound saved in transmission is a foot-pound earned at the motor. 'Just as good' and 'practically as efficient' are but excuses for the weakness of making things good enough, rather than as good as possible."—*Technical filler*.

Among those who drove cars in the Buffalo run were the following: Elmer Apperson, David Ferguson, R. H. White, Herbert H. Lytle, J. W. Packard, Percy Owen, S. D. Waldron, A. L. McMurtry, John Jacob Astor, A. L. Riker and C. W. Wridgway.

The floral parade at Cleveland proved to be an unqualified success. George S. Waite won first prize for the most artistic decoration. His car was covered with flowers, carnations on the wheels and gladiolas and carnations in the body. Six white pigeons ornamented the front of the car while the rear was a blaze of red, white and blue flowers.

An effort has been made by the Board of Trade of Middletown, Conn., to locate the Fisher Horseless Vehicle Company in that city. The company has been employing 300 men at Hoboken, N. J.

John Towns, of Hamilton, Ohio, has purchased an 8-seated automobile bus from the Haynes-Apperson Co., Kokomo, Ind.

The Century Motor Vehicle Company has shipped a two-seated surrey to Germany.

Digest of Leading Engineering Papers

MATERIALS for light-weight construction fall into two groups, those of extraordinary strength, particularly the chrome-nickel and the non-corrosive high-nickel alloy steels, and those of low specific gravity with the strength as high as obtainable. Where construction forms run to mass and rigidity, without severe alternating or local strains, those metals which are both lighter and stronger than aluminum are gaining a place for themselves. Electron, made by the Griesheim-Electron Chemical Works, has a specific gravity of 1.8 and a tensile strength up to 3,500 kg. per square centimeter. It is not yet patented in Germany, but the American patent, 965,485, July 26, 1910, gives the alloy as 80 to 99.5 per cent. magnesium and 0.5 to 20 per cent. aluminum and other metals. The principal method used for removing injurious salts from this alloy consists, according to other Griesheim patents, in melting the alloy together with an alkaline chlorid, or mixture of such, whose fusion point lies considerably higher than that of the pure alloy. In the cooling the chlorid thus congeals first, and the molten alloy can be drawn off. It is kept molten for some time, preferably isolated from the atmosphere, or a neutral gas, such as hydrogen, is injected in the molten mass, whereby the last remnant of the chlorid is evaporated. To avoid porosity in castings of aluminum-magnesium alloys a similar method is used, under German patent 228,962 (Class 31, c), October 1, 1909. It was found that the molten metal at about 700 deg. C. takes up hydrogen and does not throw it off till just before congealing. The hydrogen comes either from the hygroscopic salts referred to or from the water vapors of the fuel gases, the water vapor being split by the molten magnesium, making $Mg + H_2O$ into $MgO + H_2$. To remove the gas completely, the metal is kept for some time at the temperature at which the gas is thrown out, which is only a few degrees above the melting point of magnesium, and this may be done while the metal is in the crucible or after it is in the mold. The gas escapes in bubbles, leaving a perfectly dense alloy.

The French patent, No. 407,814, with supplementary patent No. 11,905, gives the method of Walter Ruebel for producing a magnesium alloy. Zinc or copper and zinc or copper and aluminum are the admixtures used for binding the magnesium and obviating the many chemical reactions to which it is subject in its pure form. An alloy of 96 per cent. magnesium and 4 per cent. zinc has a tensile strength of 1,500 to 2,000 kg. per square centimeter, but rolled the same alloy reaches 2,500 to 3,500 kg. tensile strength and an elongation of 8 to 12 per cent. The zinc may be increased to 10 per cent. without reducing these figures, or 6 per cent. copper and 4 per cent. zinc may be used, or 9 per cent. copper and 1 per cent. of aluminum. The magnesium, however, must not fall below 90 per cent. or exceed 96 per cent. The production takes place in a wrought iron crucible, well covered, and in an ordinary coal fire. The zinc is added as soon as the magnesium melts and is absorbed at once. If copper pieces are added, they also melt at once despite the much higher fusion point of copper.

The oxidation in pouring is slight and the casting shows a perfectly smooth surface. It can be forged and rolled and does not tarnish in air or water. It can be machined like brass or bronze.

A similar alloy, made by Basse & Selve, in Altona, Germany, with a specific gravity of 2 when cast gives a tensile strength of 1,200 to 1,500 kg., but when drawn has a density of only 1.772 to 1.780, but a strength of 2,700 to 3,000 kg. A British-made alloy, known as cork-metal, is composed of magnesium with only 0.5 per cent. zinc, and its specific gravity is 1.762. Very recently the French firm, Esnault-Pelterie, of Billancourt, has obtained

German patent No. 230,995 for an alloy composed of 80 to 85 per cent. aluminum, 5 to 10 per cent. of silver or another precious metal and 5 to 15 per cent. of a metal belonging to the iron group, such as cobalt, chromium, nickel or manganese. The silver has the effect of preventing the segregate crystallizing of the other metals, and a tough alloy is the result. In the production, the silver and the chosen metal of the iron group are first separately melted, then mixed in the desired proportion, and the mixture is then added to the molten aluminum.

The Ferro-Nickel company of Paris holds German patent No. 231,060 on a composition of 94 to 98 per cent. aluminum, 1.5 to 4 per cent. copper, 0.25 to 1.25 per cent. manganese and 0.25 to 1.25 per cent. silver. The total of the three admixtures must be between 2 and 6 per cent. These alloys can be drawn, stamped, forged and rolled, both cold and hot, and reach 2,800 kg. tensile strength per square centimeter with 1,400 elastic limit and 16 per cent. elongation in rolled and annealed strips 1 mm. thick. Rolled but not annealed, the tensile strength rises to 3,700 kg., but the elongation drops to 1 to 2 per cent.—Dr.-Ing. A. Sander in *Dinglers Polytechnisches Journal*, August 19.

QUALITY TEST FOR FINISHED STEEL AND METAL PARTS.—As the strength and other important qualities of an article made from steel depends to a considerable extent upon its shape and dimensions, if it has been subjected to heat treatment as well as in the case of castings, tensile tests applied to standard test pieces are not always available or practicable, and at all events they would not answer the question which is frequently the most important and which relates to the strength or hardness and resiliency in various portions of the same article. In this respect the method for determining hardness by indenting the article at various points of its surface by means of a steel ball of given diameter to which a given amount of pressure is applied and then measuring the indentations, has evident advantages. These the author has investigated through a series of experiments. He finds that the different portions of the same article usually show considerable variations under the ball-pressure test, but that the variations which should be ascribed to uncertainties in the testing method represent less than 10 per cent. of the variations which are actually existent in the tested article, provided proper scientific precautions are observed, and that the method therefore possesses a genuine value. It was found that the indentations are always accompanied by a conical rise or swelling of the adjacent metal and that the rapidity with which pressure is applied affects the result considerably, rendering it necessary to establish a uniform and slow action of the pressure levers for purposes of comparison. Other matters which were considered in the experiments related to the shape of the surface at the spot where pressure was applied and the direction of the "grain" of the metal, as determined by rolling or forging. No mention is made of the scleroscope, in the use of which the rebound of a steel ball allowed to drop from a certain height upon the article to be tested is measured in order to determine hardness and resiliency.—Capitaine Gard in *La Technique Moderne*, June and July.

THE WHIP AS AN ACCESSORY.—In Germany the whip is becoming an accessory for automobile tourists, according to *Allgemeine Automobile Zeitung*. It has been found that cows, though they refuse to get out of the road in front of an automobile until bumped into, respond at once to the persuasion of a whip, and an enterprising firm has consequently placed an automobile whip in the market. It is of such dimensions that it can conveniently be put away under the seat until there is need for its services.

Little Bits of Motor Wisdom

Pertinent Pointers for Repairman and Driver

THE FACE SPANNER—It very often happens that a screw cover is placed in such a position that it is impossible to have a projecting nut on the outside of the cap. In this case the difficulty is generally surmounted by having a face plate cover in which there are two holes to take corresponding projections on the face spanner. The face spanner and the cover plate are illustrated in Fig. 1. In making this type of cover a depth will have to be allowed that will permit of the insertion of

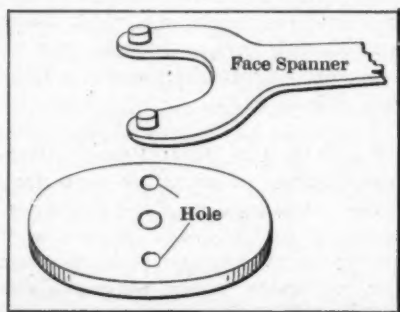


Fig. 1—Face spanner and face nut, showing holes in nut and projections on spanner

the wrench, for if the holes are too shallow it will not take much of a pull to tear them so that the cover will be worthless. Another method of making this type of spanner is to have it arranged so that it will fit around the cover plate, with a projection on the inner edge of the curve to fit into the corresponding hole in the disc.

A tool of this nature is generally sent with a piece of machinery in which there are nuts of this type, but in case it is ever necessary to turn them and the wrench is not accessible it is very easy to do it by hammering upon the slots. A piece of hard wood should be placed against the hole and the end can be hit with a hammer or mallet. The object of using the hard wood is that the use of metal would be injurious to the edge of the hole and hence the next time the wrench was called into service it would slip out.

THE INDUCTION COIL—When the high-tension system of ignition is used with dry batteries an induction coil is used to transform the low-tension current of the batteries to the high-tension current which must be sent to the spark plug in order to jump the gap between the sparking points. The low-tension make-and-break ignition is effected by the electric arc described when two points break contact. The high-tension current, however, owing to its high

pressure, will jump across a gap to complete its circuit.

The coil consists primarily of a soft iron core which is wound with coarse wire, this winding being placed around the tube which insulates the core. This winding is known as the primary winding and it is to this wire that the batteries are connected. The various turns of the primary or battery coil are insulated so that they are never in contact with each other.

After the primary coil has been wound about the core the secondary coil is placed about it. The secondary coil consists of very fine wire with a great number of turns, each insulated from the other in the same manner as the primary coil, great care being taken that there shall be no electrical connection between the primary and secondary windings. The greater the number of turns on the secondary coil, the greater the electromotive force produced by the coil, and naturally the higher the price of the coil.

The ends of the primary wire are led to the outer casing of the box in which the coil is always packed, one end being attached to a binding post, while the other is connected to the current interrupter, generally known as the vibrator or trembler, and then to a binding post. The ends of the secondary winding are attached to binding posts on the coil box, one fastening being made to the same binding post as that to which the end of the primary

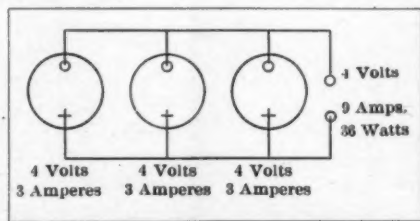


Fig. 2—Showing voltage and amperage at the terminals when connected in parallel

wire was attached, while the other is connected to a separate binding post. In coils not intended for ignition purposes the terminal of each winding has a separate binding post.

The battery is connected to the primary coil in such a way that the flow of the current is through the coil, trembler and back to the battery through a ground connection made to the engine frame. The trembler is a thin flat piece of metal which is held away from the core of the primary winding by means of a weak spring. At the other end of the flat trembler there is a

fixed connection with the ground and a contact point with the primary winding, which is fixed as long as the trembler is in its normal position. When it is moved so that the contact points do not touch each other there is no electrical connection between the ground and the primary winding, or, in other words, the primary or battery circuit is broken. When the switch is closed a current passes from the battery through the primary coil, magnetizing the soft iron core. This magnetism draws the trembler to the core against the resistance of the weak spring, but in drawing the trembler towards the core the circuit is broken and the soft iron loses its magnetism, allowing the vibrator to return by means of the spring to its original position. The circuit is then closed again and the core remagnetized, whereupon the interruption of current again takes place and the trembler flies back into its original position, going through the same process repeatedly. These actions and reactions take place so rapidly that when the tension on the vibrator spring is properly adjusted a continuous humming sound caused by the vibration of the metal may be heard. The sound forms a means by which the practiced ear can distinguish the correct and incorrect trembler adjustments.

Each time the current through the primary winding is interrupted a counter-current of high voltage is induced in the secondary winding. The secondary winding is connected to the ground and to the spark plug, which is so constructed as to take the ground current and the direct wire without short-circuiting. The high-tension current thus induced leaps the gap between the points of the spark plug and produces a spark. Since the number of vibrations (and hence interruptions of the primary circuit) is so great, the high-tension current is likewise interrupted at the same speed and with the same frequency, so that instead of a single spark being sent across the gap in the sparkplug a continuous stream of fire is passing between these points, producing a hot and effective form of ignition.

In order that the sparks will not be continuously passing between the sparking points in the plug at the wrong time, a timer is inserted in the line, which switches the current to the cylinder at which it is needed at any given time. The timer is driven directly from the engine and may be advanced or retarded on its shaft from the driver's seat to correspond to the different positions of the throttle.

VOLTAGE AT BATTERY TERMINALS.—Up to a certain point, which is measured by the magnetic capacity of the soft iron core of the induction coil, the spark in a high-tension system will increase with the voltage sent through the primary coil. When the batteries are attached in serial form as shown in Fig. 3, where three batteries are connected for the purpose of illustration, the total voltage amounts to 12, while the amperage is 3. That is, where the batteries are connected in this manner, the effect is that of adding the voltage of each until the total at the terminals is equal to the sum of the voltage of all the batteries. In the case taken for illustration each battery had a capacity of 4 volts, so that at the terminals the electro-motive force was equal to 12 volts.

In connecting in series, the carbon point of each cell is connected to the zinc of the succeeding battery until the batteries are all joined together, leaving a carbon terminal free at one end of the chain and a zinc at the other. It is not true that when additional batteries are put on the circuit in connecting in this manner that the current is increased in the same proportion as the number of cells, but when used with the high external resistance given by an induction coil, the increase is very nearly proportional to the increase in the number of cells.

When connecting in parallel, as shown in Fig. 2, the current given off is just about equal in voltage to one battery if the external resistance of the circuit is high, while the amperage is equal to the sum of that of all the batteries. The watts in both cases are the same, 36, being, of course, the product of the voltage and amperage.

NECESSARY TO WATCH BEARINGS.—Whether the bearings be roller, ball or plain they are without doubt the most necessary parts of the car to watch. Every car owner or driver should know, after he has had his automobile for even a short time, the location of every bearing throughout the car. The symptoms of bearing trouble are always very evident, but the mere fact of their prominence suggests that they come when it is generally too late to avoid trouble.

When traveling along smoothly a grinding or grating noise of somewhat mysterious origin will sometimes make itself heard to the driver. The car will continue to run smoothly for a while until the grinding noise is followed by a breakdown which will nearly always be beyond the scope of roadside repairs. The general symptoms of bearing trouble are a grinding sound or in plain bearings a squeak, the latter generally being accompanied by heat. In other parts of the car there will be an excessive side play and a variation in the tightness of adjustment between one side of the bearing and the other. A plain bearing which has been allowed to become superheated will often seize.

The principal enemy of any bearing, if it has the proper care so far as lubrication is concerned, is grit. Grit will often be carried into a bearing by the lubricating oil, so that it is necessary in the first place to ascertain that the oil which is used for lubrication is of such quality that it is reasonably sure to be clean. To prevent the collection of grit, the bearings should be occasionally taken down and cleaned out. At these times the adjustment should be carefully examined and an excessive amount of play not allowed. Too tight an adjustment of any bearing is as serious a fault as too loose, as the oil will not be able to prevent the bearing from overheating on account of the increased friction. Ball bearings should be frequently examined for wear, since when the adjustment becomes loose the chances of the balls being fractured are greatly enhanced. A slight amount of wear can be taken up on the adjustment of the bearing, but where it is excessive the balls should be replaced at once.

Roller bearings give evidence of wear by a rattling noise which gradually increases as the wear becomes greater and the rollers are fractured. If taken down the rollers which are affected by the wear will be noticed to have grooves which have been worn into them. Roller bearings, like ball bearings, are very seriously affected by grit, and it is very necessary that they be examined occasionally in order to ascertain if they are perfectly clean.

If a bearing runs hot while on the road and the driver is fortunate or skilful enough to detect it before seizure or serious damage occurs, the car should be stopped and allowed to stand while the bearing is cooling. The cooling should not be hurried by pouring cold water on the heated metal, as the result is very liable to be disastrous to either the shaft or bushing. A limited

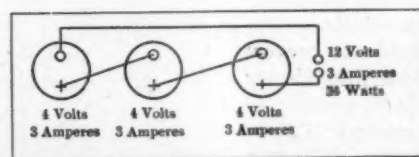


Fig. 3—Showing voltage and amperage when connecting batteries in series

amount of oil may be poured on the warm bearing if it is desired to cool quickly, but even this practice is not as good as to allow the bearing to cool slowly.

If a ball bearing should fail through the breakage of one of the balls it is necessary to stop and carefully remove every piece of broken metal from the ball race, for if this is not done the other balls will be ground to pieces after having run for a very short distance. The ball should be replaced by one which is exactly the same size. If too large a ball is used the results would be much worse than if the car were run on a bearing which consisted of one ball less than the original number.

WHEN HEATING GLUE.—The purposes for which glue is used are so numerous that it is often called into service around the garage as well as in other work. It requires heating after it has stood for any length of time, so that it is often necessary to wait until it is sufficiently heated in an uncovered water pot, since the glue cannot well be placed directly upon the fire. There is a form of glue pot which is much used among wood workers which would be a handy adjunct to the outfit of any garage where repair jobs are done. It is illustrated in Fig. 4, and consists of two

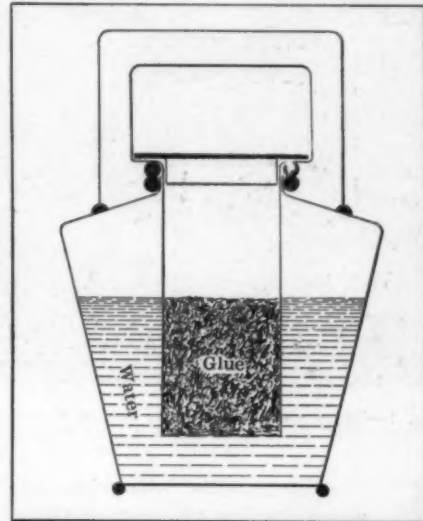


Fig. 4—Form of glue pot often used among wood workers. Adaptable to garage work

pots, an inner and an outer, which fit together.

The outer pot contains water while the inner fits directly into it, being supported by the top as shown. Since the inner pot is suspended in this manner the water is free to circulate about it and when placed upon the stove all the heat will be concentrated upon the glue in the inner pot. The cover prevents the escape of vapor from either the water or the glue pot, thus doing away with the unpleasant odor which generally accompanies the process of heating glue. The glue will be kept warm for a longer period of time, as the heat will be contained within the closed vessel instead of being given off to the surrounding air.

There are two handles on the pot. The outer handle will lift the entire outfit in case it is desired to keep the glue surrounded by the hot water, while the inner handle is for carrying the glue receptacle alone.

CARE IN FITTING SPARK PLUGS.—When screwing the spark plug into the cylinder care must be used so that the porcelain insulation on the outside is not cracked. An elusive misfire may frequently be traced to this cause. The current leaks from the grounding in the cylinder and creates an intermittent short circuit. There are several devices which have lately been placed upon the market for detecting just such a state of affairs.

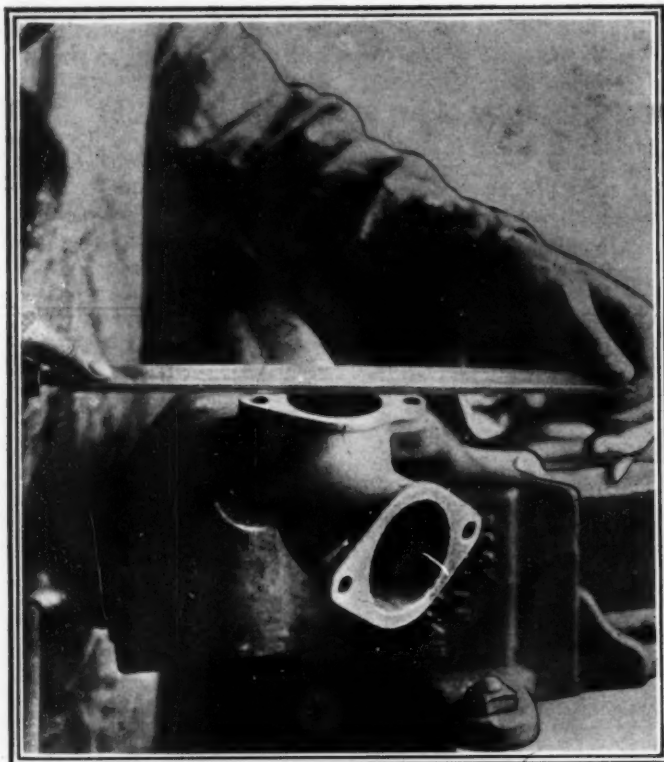


Fig. 1—Filing manifold flange to receive a new gasket properly, after the old one has been scraped off

TO the automobilist who takes care of his own car the words "tuning up" express the very essence of careful inspection of the machine and the elimination of the slightest imperfection in any part of the running gear. It is a process which is something beyond the ordinary inspection which the car is given before being taken out for a run in the country, and expresses a greater refinement of every part of the mechanism than that given in the average overhauling. The elimination of noise goes hand-in-hand with the promotion of efficiency, and it may be said, in fact, that the elimination of all noise would mean the attainment of the highest degree of efficiency possible. Friction produces noise and heat which are both forms of energy and hence represent the dissipation of the power which might have been through better mechanical arrangement, added to the propelling force of the vehicle.

It is, of course, understood that it is impossible to prevent the loss of mechanical energy which takes place through the friction of joints and bearings any more than it is possible to eliminate giving away part of the power of the motor by throwing heat into the cooling water to keep the cylinder walls at a temperature at which they will work to the greatest advantage. All these heat losses and other losses are to a large extent necessary, but in the car which has been properly tuned up they have been reduced to a minimum. In the matter of bearings, for instance, an adjustment may be made which, while allowing a small amount of play, still holds the bearing properly to its work. Such an adjustment may be made in the universal joint, as shown in Fig. 2, where the act of making the adjustment is depicted. In this case the block B can be allowed a little play and the efficiency of the joint still be maintained with a slight gain in flexibility. The play given must be very slight—in fact, so slight that it can hardly be detected, but if the adjustment be correctly made, it will be found that the resistance to the free movement of the block in the fork will be practically nothing. Breakage of the universal joint, while not a common occurrence, will sometimes happen where the shaft has been considerably thrown out of alignment on account of some accidental derangement of the drive. Such a case is illustrated in Fig. 3, where B is the casing ring, F the collar, C the clip which has been bent

Careful Inspection

Look for and Remedy Leaky

back, and R the spindle about which the missing roller revolves.

Leaky manifolds are encountered at times and the hiss of the loose exhaust is unmistakable. In this case the joint is generally found to be defective owing to the gasket having been burnt or worn out. A very satisfactory repair may be quickly made by merely cutting a new gasket and fitting it in place of the old one. This is not the kind of repair, however, that is made in carefully tuning up the motor to secure the highest efficiency in all its parts, as very often at least a part of the old gasket will find its way into the manifold and cause trouble eventually. If the exhaust pipe is carefully removed and clamped in a vise, as shown in Fig. 1, and the file worked over the surface of the flange after the old packing has been carefully scraped away, a much more satisfactory job will be made and the man who performs the work will have classed himself with those whose automobiles far outlive the cars which receive nothing more than the average care. In filing the flange in the horizontal manner depicted in the illustration referred to above, a burr will be raised on the inner edge of the flange which should be removed. This is done by filing vertically, as shown in Fig. 4, where the operation of removing this burr is depicted.

Besides the matter of manifolds and bearings there are many others which should claim the attention of the automobilist if he entertains the idea of maintaining his car at the highest state of efficiency, either as a matter of economy or pride, or both. One of these points which require the attention of the motorist who aims at the attainment of the highest power possible from his engine and yet is very frequently overlooked is the muffler. A muffler is designed for the purpose of silencing the exhaust, which without it would be very noisy. To silence



Fig. 2—Manner of adjusting for play in universal joint with a wrench and screw-driver

the exhaust a certain amount of power must be sacrificed by increasing the back-pressure against the exhaust of the motor. After a time, especially if the motor has been running with a superabundance of lubricating oil, the muffler becomes clogged with soot and dirt, thereby increasing the back-pressure against the exhaust. The loss of power occasioned by the resistance to the free exhaust is very large, and hence care should be taken to remove the muffler casing from time to time to remove the deposit.

A slipping clutch is an evil that should be corrected as soon

Will Pay the Owner

Joints, Slipping Clutches, Etc.

as it manifests itself, for each time that the clutch slips an additional glaze is given the leather if it is a leather-faced cone clutch, and the trouble which at first seemed very unimportant may result in disaster on a steep, slippery hill. The life of the clutch can be prolonged if care is used in driving the car and an occasional dressing with neat's foot oil is applied.

The needle valve on the carburetor will occasionally need grinding in the same manner as the valves in the cylinder head. If it is noticed that too much gasoline is fed to the motor at low speeds the trouble is often at this point. It is, of course, frequently due to the presence of a piece of foreign matter which has found its way from the gasoline tank into the carburetor, but occasionally it will be found that after having driven the car for a long time with the same carburetor the needle valve will require this adjustment. When the valve is ground the attachment of the float will have to be inspected and perhaps regulated in order that the gasoline level in the float chamber will correct; that is, about 1-32 of an inch below the spray nozzle.

Another feature which may be given attention in the final tuning up of the car is the distance between the points of each spark plug and whether they are choked with soot or are bright and clean. A considerable falling off in power will be the result of a dirty spark plug, and the same may be said to be true of one in which the gap is not great enough. When the gap is too wide the explosions will be irregular or the particular cylinder in which the defective plug is located will be "dead" entirely.

The constant vibration and jar of the car will loosen the battery and other terminal connections after the car has been

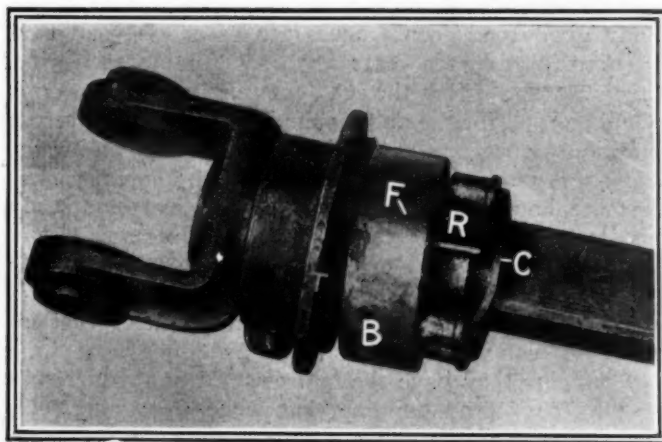


Fig. 3—A universal joint which has been broken by being knocked too far out of alignment

operated over rough and difficult roads. These should be examined from time to time in order to ascertain if they are tight as well as to determine whether any deterioration has resulted from contact with acids or other materials which would be apt to affect the wiring. If the contact points of all the wiring are first scraped and then rubbed with a piece of emery paper before the binding posts are screwed into position the contact will be much better than if the connection were carelessly made, and the spark will be hotter and hence more satisfactory. Badly-made connections form a resistance against the flow through the elec-



Fig. 4—Removing the burr after having filed the manifold flange to take the new gasket

tric circuit and hence cut down some of the electro-motive force that might have been used in producing a good spark. A very good plan that is sometimes used in careful wiring is to slip a piece of rubber tube over the wire and the terminal. This will tend not only to protect the wiring from galvanic action, but also to hold it in position in spite of vibration.

The maintenance of a clean radiator and circulating system is of prime importance. When the radiator is designed for a certain motor the area of cooling surface and the quantity of cooling water required for various engine speeds are determined. A factor of safety over the required area is allowed so that in case of an overload or other unforeseen condition the radiator will be able to adequately care for the motor. These calculations are all based on a clean radiator and not on one which has been fouled and clogged through neglect. A monthly cleansing will go far in creating a condition of high efficiency and economy in the motor.

Tire troubles are the bugaboo of the automobilist. The high price of rubber and the necessity of using the purest and highest grades in the manufacture of tires, have brought about this condition. If it were realized that the proper way to take care of a tire is not to place it on the car and then forget it until the much-dreaded blow-out occurs, methodical and frequent inspection of the outer casing would be the rule of every automobilist who desires to have the maximum pleasure from his car at the smallest monetary output. There are many very satisfactory vulcanizing outfits on the market which make it easy for the work to be carried out in a garage which is not overstocked with tools. A car cannot be said to be properly put in condition if it is allowed to go out with the tire casings cut. One of the greatest causes for the rapid deterioration of tires is the fact that water will work through the cuts and rot the fabric. This will eventually lead to a burst which could easily have been prevented with a little energy and foresight. In the points mentioned, as well as in all the other details which will present themselves at different times to the car owner and driver, a careful supervision will be rewarded by a prolongation of the life of the car and increased comfort in driving.



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No. 12

THE CLASS JOURNAL COMPANY

H. M. SWETLAND, President

CONDE NAST, Vice-President and General Manager

E. M. COREY, Secretary and Treasurer

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Track Racing Danger

THE accident that happened last Saturday at the track meet at Syracuse when eleven lives were taken is one that might happen at any track meet where the spectators are not kept in proper bounds. The outer and inner fences, which may be entirely safe for horse racing, are most inadequate when automobiles engage in speed contests, and wherever spectators are allowed to stand close behind such fences, whether on the stretches or on the curves, they place themselves in great danger, for should a tire go at such points there is a chance that the car may dash through the fence. The safety precautions that are adequate for horse racing are not to be even considered as possessing a shadow of what is required for automobiles. The only safety precaution that is adequate for racing cars is a low cement wall such as is used on the Indianapolis speedway; or low plank fences just high enough to catch the hubs of the racing cars and prevent them from leaving the track. Such fences are used on the motordrome in California, and similar precautions were taken on the Atlanta speedway and at the recent Elgin races in front of the repair pits extending along the grand stand.

Track race promoters and owners of horse tracks have been complaining all summer that the American Automobile Association has been placing undue, or unnecessary, restrictions on track races; as a matter of fact they have not been placing half enough restrictions upon them. A track owner imagines that because his track, with fences, paddock and spectator arrangements, is safe for horse racing, it is similarly so for automobile racing. This is as far from the real situation as can be imagined. Spectators must be protected no matter what the cost, and if the automobile sport-governing body does not make its promoters, to whom sanctions have been issued, furnish that protection, then the courts will step in and demand the protection or legislate against track events. What is needed most of all in track races is a safety wall along the outside and the inside of the track where spectators are bound to gather. If this costs too much money then the ground surrounding the

track should be so fenced off that spectators cannot get within 75 feet of the side of the track—that is, the inner or the outer fence. This neutral zone would give the driver a chance to reduce the car speed and give spectators a chance for safety. Such fencing would not be a hardship because with all of the spectators that distance back from the track a better general view of the contest would be afforded. Quick action of this nature should be taken by the American Automobile Association, and the Manufacturers' Contest Association should be ready to back up the A. A. A. in such work. Human life must be protected; the spectator has to be looked after; the driver knows he is engaged in a dangerous occupation and takes his chances, but this does not apply to the spectator.

* * *

Practical Road Work

GETTING the different road commissioners of various States together for joint conferences and making an inspection of the roads in their respective States, as was done this week with the co-operation of the Touring Club of America, is a commendable enterprise. Good roads conventions are generally held in hotel parlors, or in the auditorium of a theater or music hall; but here is an example of where the meeting has been taken onto the highway, where the roads are on exhibition. It is the most practical, common-sense scheme that has been worked out along the good roads line and should be most productive of results. It is one thing to talk the construction and maintenance of good roads in a nice warm room at a convention, and it is another thing to get into a line of automobiles and go over the roads in rain and shine and see at close quarters just what are the conditions.

If there is any department of the automobile industry that needs the practical seed sown—and good roads must be considered such a department—it is this one. Many good roads conferences are based on road construction ideas of ten years ago under the horse régime. This is wrong. What the road commissioner has to do is to build a road for the automobile and study from present conditions what are the defects in existing highways. When the automobile road is finished the commissioner must see how it stands the traffic. He can best study this by travelling over the road in the automobile.

Other States would do well to imitate the example that some of the New England States have set. It is better for the commissioners of several States to get together and compare notes. The road chiefs of one State may imagine they have the entire world at their feet in the matter of road building, but when they meet with commissioners from other States they may find that there are other chapters to the good roads ritual. Unanimity is most essential in good roads work. The automobile is an interstate vehicle of travel; each automobile owner has more or less interest in the acts of the road builders in adjoining States. For this reason the interstate scheme of inspection is preferable to the State system. Continue the State system; where it has not been instituted, start it at once. But by no means end here; take the additional step of getting several States to unite. This will be of great assistance when it comes to the matter of mapping out and building as well as caring for interstate road systems.

Gossip of the Coming Shows

ARRANGEMENTS for both National automobile shows that will be held in New York in January, are progressing satisfactorily. While no definite official announcement has been made that the third show has been called off, nevertheless it will not be held. The reasons for this are twofold. In the first place the Columbus Buggy Company, Geneva Wagon Company, Seitz Automobile and Transfer Company, Maytag-Mason Motor Company, Lion Motor Sales Company, Alpena Motor Car Company, Roder Car Company, Vandewater and Company, Crawford Automobile Company, Warren Motor Car Company, James Cunningham and Son, McFarlan Motor Car Company and the Michigan Buggy Company, all of which were represented at the show held under the auspices of the A. M. C. M. A. E. last year at the Palace, have been reinstated to good standing in the N. A. A. M. and will show at the exhibition of that organization at the Grand Central Palace from January 8 to 19.

The N. A. A. M. show is looming larger every day and in the accessory line it will probably be of such size as to compare favorably with the display in Madison Square Garden. The news was announced to-day that no dates had been given for the third show which was to have been held at the Palace. The management of the Palace would say nothing further and Mr.

Longendyke, secretary of the A. M. A. A., was not available for a statement.

Aside from the twenty odd concerns members of the N. A. A. M. and not members of the Automobile Board of Trade, all of which will show at the Palace, the list given above will constitute an imposing array of exhibitors at the N. A. A. M. show.

At the offices of the Motor and Accessory Manufacturers it was announced that circulars had been issued to its members asking that applications be made for space at either of the national shows. Drawings will be held October 4. In some cases the same concerns will exhibit at both shows and it is estimated that the total number of members of the organization will approximate 150 at each. Independent manufacturers will have an opportunity to display their wares at all the automobile exhibitions this year.

With regard to the Garden exhibition, which will be of two weeks' duration, the car exhibitors will include only members of the organization. But there will be numerous companies outside its membership which will show other lines than automobiles. The motorcycle section, which will be housed on the Twenty-seventh street side of the Garden, will be far more complete than ever before.

New Motor Speedway

EARLY last week was incorporated in Trenton, N. J., the Metropolitan Motor Speedway Association, whose object, as stated in the incorporation papers, will be to conduct races, contests, exhibitions with automobiles, balloons, airships, etc. The incorporators named in the articles are I. Newton Quimby, Francis V. Dobbins and Edmund S. Johnson. The capital named is \$1,500,000.

The location selected for the speedway, which will be a two-mile circuit, is on the meadows between Newark and Jersey City. The ground is at present a swamp, but the amount named in the articles of incorporation would seem to be quite sufficient to float the venture, for the ground is absolutely useless as it stands at present, and will be for years to come for any other purpose than that contemplated in the new incorporation. It is located about five miles west of the Hoboken Ferry, and could be reached from Columbus Circle in less than a half hour.

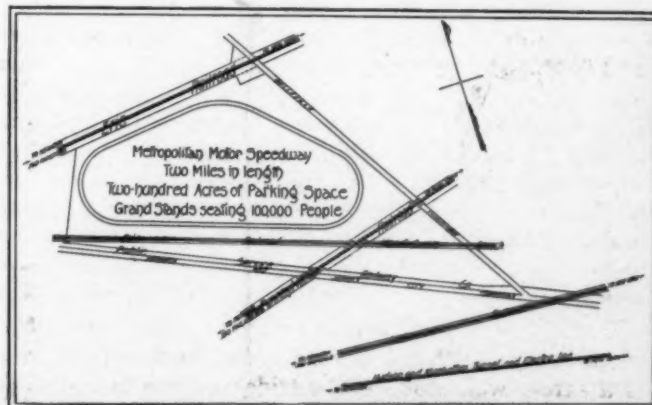
The course as planned will have but two real turns. On the south side, there will be a straightaway of 3,421 feet with two smaller straightaways on the backstretch—one 1,280 feet and the other 1,745 feet long. The track will be of sufficient width to accommodate large fields of starters, and so banked at the turns as to combine speed with safety.

The total amount of land involved is 330 acres, giving ample room for stands to accommodate 100,000 people and parking space for 10,000 automobiles. As regards accessibility, the new speedway is on the lines of the Pennsylvania; Delaware, Lackawanna & Western and Erie railways, including the new line from Manhattan Transfer into the Pennsylvania station at 33d street and 7th avenue. The Newark and Jersey City turnpike is on the south side of the proposed speedway, and the Belleville turnpike touches its northeastern corner, the trolley line of the Public Service Railway Company following the former from Jersey City to Newark.

Glidden Has 50 Entries

ABOUT two weeks from the date set for closing entries for the 1911 Glidden tour, the list contains 50 names and from present indications will be increased to at least 75 before the time limit has elapsed. The additional names that have been placed on the list during the past week include the following: E. R. Brackett, Jacksonville, Fla., Stoddard-Dayton; Atlanta Ad Men's Club, Atlanta, Ga., Corbin; R. S. Hall, Ocala, Fla., Cadillac; J. Epps Brown, Atlanta, Thomas; Charles Crook, Atlanta, Ga., Packard; Bob King, Anderson, S. C., Mitchell; K. P. McNeil, Jacksonville, Fla., Cadillac; L. C. Brown, Atlanta, Ga., Mitchell; St. Elmo Massengale, Atlanta, Ga., Garford, and Griffith Implement Company, Athens, Ga., Schacht.

The pathfinding Flanders has finished its course and is in Jacksonville, after a pleasant and speedy trip. The worst roads of the tour were found the last day and at present a big gang of men is engaged in making improvements.



Plan of the proposed Metropolitan motor speedway on the meadows between Jersey City and Newark



Bird's-eye view of the new and modern plant of the American Simms' Magneto Company at Bloomfield, N. J.

BLOOMFIELD, N. J.—The main building of the new plant of the American Simms Magneto Company, occupying 4 1-2 acres. A unit type of construction has been employed, consisting of reinforced concrete beams and girders. The walls contain 18,942 square feet of glass with a wall surface of 16,500 square feet. There are 15,500 panes of glass, 3,100 feet of partition, about 1,400 electric lights, 1,000 steel lockers and 650 shaft hangers used for the support of shafting.

The power house is a separate building in close proximity to the main plant, and contains 6,000 square feet. There is an artesian well which goes down 560 feet on the premises, and supplies 65 gallons of water per minute for the boiler feed and drinking water. Between the power house and main plant is located a reservoir of 90,000 gallons capacity to collect the rain water for the purpose of neutralizing the artesian well water.

LOUISVILLE, KY.—The Dunham Auto Company has taken the agency for the Fiat car.

HARTFORD, CONN.—Kilby & Barrett have taken the local agency of the Bassel truck for this section.

GRAND RAPIDS, MICH.—The Ignition Starter Company has decided to remove its factory to Detroit.

LOUISVILLE, KY.—The Glenn - Bauer Motor Company has acquired the agency for the Broc electric.

LOUISVILLE, KY.—Oscar Erni, of New Albany, Ind., is the new agent for Interstate cars in Louisville.

LOUISVILLE, KY.—The Wieland Company, 217 South Ninth street, has closed a contract to handle the Elmore car.

MINNEAPOLIS, MINN.—The Foster-Lawrence Company has been formed in St. Paul and will handle the Stearns car at 142 West Fifth street.

BOSTON, MASS.—The agency for the National car in Boston has been dropped by Frederick Randall, who has been handling it for some months.

TRACY, CAL.—C. A. Howard has taken the agency for Marion cars in San Joaquin County and will maintain salesrooms in Tracy and Stockton.

KANSAS CITY, MO.—On Wednesday last the entire stock of the McFarlan Six Sales Company was destroyed by fire. The loss is estimated at \$5,000.

MANITOWOC, WIS.—Hagen & Van Akin have been appointed local agents for the Rambler and intend to build a garage and salesroom in the Spring.

COSHOCOTON, OHIO—The City Council of Coshocton, Ohio, has enacted an ordinance prohibiting the use of any excepting rubber-bulb auto horns within the city limits and making it a misdemeanor for an autoist to leave his muffler open on the city streets.



The new Gray & Davis factory building, Boston, which is devoted exclusively to the manufacture of dynamos for use in automobile lighting. The factory is constructed entirely of cement brick.

WASHINGTON, D. C.—The DeTamble agency has been given to the Ohio Motor Sales Company, who also handles the Ohio at 302 Sixth street, N. W.

BOSTON, MASS.—The Henry Motor Car Company that handles the Henry for New England is being reorganized so that it will have a larger working capital.

MILWAUKEE, WIS.—The Simplicity Steam Vulcanizer Company has opened a Milwaukee office at 403 Grand avenue under the management of A. S. Pierce.

SACRAMENTO, CAL.—J. L. Whitmore, proprietor of the Central Auto Company, of Stockton, Cal., has taken on the Chalmers agency for Sacramento and vicinity.

MILWAUKEE, WIS.—The Putnam Automobile Company has taken occupancy of the garage formerly owned by the Mau Automobile Company at 312 Twelfth street.

MILWAUKEE, WIS.—John S. Collins, of Saginaw, Mich., has been appointed manager of the Wisconsin branch of the Buick Motor Company to succeed George P. Hewitt.

BOSTON, MASS.—The F. R. Parker Company that handled the Elmore in Boston for several years has gone out of business and the Elmore is temporarily without an agency in the Hub.

LOUISVILLE, KY.—Edwin H. Chase, Jr., is the new manager of the local branch of the Olds Motor Works. He succeeds T. F. Smith, who returns to the factory at Lansing, Mich.

PHILADELPHIA, PA.—Announcement has been made of the removal of the Central Auto Supply Company to larger and better equipped quarters at the southwest corner of Broad street, Ridge and Fairmount avenues. The company deals in automobile tires, accessories and supplies, and motoring apparel for men and women. Frank Stehle is manager.

MILWAUKEE, WIS.—The George W. Browne Motor Company, factory distributor of Overland and Marmon cars, is now located in its new garage and salesrooms at 458-460 Milwaukee street.

STEVENS POINT, WIS.—G. A. Gullickson, of Iola, Wis., and P. W. Holton, of Nelsonville, Wis., have formed a partnership and will handle Ford business in this territory, with headquarters in the McDonald building.

COLUMBUS, OHIO.—The Rusk & Hallock Automobile Company, located at 244 North Fourth street, Columbus, Ohio, has closed a contract to handle the DeTamble in thirty counties in central and southeastern Ohio.

MILWAUKEE, WIS.—The Goodyear Tire & Rubber Company, of Akron, Ohio, has opened a Milwaukee branch at 134-136 Oneida street, in charge of H. B. Ziegler, formerly traveling representative in this State.

BOSTON, MASS.—The latest concern to establish itself in the Hub is the Boston Motor Wagon Company. Salesrooms have been opened in the Motor Mart, Park square. G. Frank Davenport is manager of the new company.

SAN FRANCISCO, CAL.—The Oakland cars will hereafter be represented here by the Consolidated Motor Car Company, with G. A. Boyer as manager. This concern is also northern California representative of the Pope-Hartford.

MINNEAPOLIS, MINN.—Motorists in St. Paul want the fire department to standardize its warning signals on apparatus and then they will be willing to keep that style of sirens off their cars. They protested against a proposed ordinance prohibiting the use of sirens and other horns on all motor vehicles except those belonging to the fire department, hospital ambulances, police and fire insurance patrols.

SAN FRANCISCO, CAL.—The northern California agency for the Oakland car has been taken by the Consolidated Motor Car Company. The latter for the past two years has been distributor of the Pope-Hartford car exclusively.

MILWAUKEE, WIS.—The Oakland Motor Car Company, of Pontiac, Mich., has established a Wisconsin branch at 116 Mason street, Milwaukee, in charge of R. A. Creek. The local agent is the Smith-Hoppe Auto Company, 116 Mason street.

COLUMBUS, OHIO.—Frank J. Girard, who was connected with the Curtin-Williams Automobile Company, of Columbus, Ohio, for eleven years, has taken the central Ohio agency for the Peerless. The agency is located at 174 North Fourth street.

SEATTLE, WASH.—F. A. Bardshar, manager of the Stevens-Duryea and Marion agency, has recently added the Maxwell car to his line. His territory will include the State of Washington west and north of the Columbia river.

KANSAS CITY, MO.—The Bond Motor Company, distributor for the Franklin, Everitt 30 and Krit cars, will erect a three-story building at 1615-1617 Grand avenue, in the heart of automobile row. The building will cost \$60,000.

PHILADELPHIA, PA.—New and larger quarters have been established by the Century Automobile Sales & Supply Company at 520 North Broad street. The company will be the agent in Philadelphia and vicinity for the Pathfinder automobile.

SEATTLE, WASH.—George E. Johnson, manager of the Mitchell Motor Car Company, Seattle branch, was elected president of the Seattle Auto Dealers' Trade Association at the annual election held the past week. P. R. Sands, of the Flanders agency, was elected vice-president; Ira D. Lundy, of the Stoddard-Dayton agency, treasurer, and E. J. Strelau, secretary.



Test bench where dynamos for car lighting are tried out and checked to insure uniformity of service. Careful records are kept of the performance of each instrument during the trials

MILWAUKEE, WIS.—Walter S. Shawvan, who has been associated with the McDuffie Automobile Company, Wisconsin agent for the Stoddard-Dayton for several years, has been appointed Milwaukee agent for the Thomas Flyer.

SAN FRANCISCO, CAL.—B. F. Jacobs, sales manager of the Motor Car Manufacturing Company, of Indianapolis, has placed the northern California agency for the Pathfinder and Parry cars with the Motor Car Manufacturing Sales Company, of San Francisco.

KANSAS CITY, MO.—A change of managers has been made in the local United Motors branch. George W. Jones, former manager, has taken charge of the Des Moines branch and C. E. Hathaway, brother of the district manager, is now in charge of the local branch.

MILWAUKEE, WIS.—The Hichman-Lauson-Diener Company, 222-224 Fourth street, Milwaukee, Wisconsin distributor of the Ford, has leased the big garage and salesrooms of the McDuffie Automobile Company, Wisconsin agent for the Stoddard-Dayton, at 141-145 Eighth street.

LOS ANGELES, CAL.—There will be no auto show this year under the auspices of the Los Angeles Motor Car Dealers' Association. Final action on the proposition was taken at a meeting of the officials during the past week. The show was voted down by 19 against and only 8 for a show.

SAN FRANCISCO, CAL.—The local branch house of the Lozier Motor Company, of Detroit, is now permanently located in its magnificent new quarters on Van Ness avenue, close to the corner of Golden Gate, which is regarded as the center of automobile trade activities in San Francisco.

COLUMBUS, OHIO.—The E-M-F & Flanders Sales Company is the name of a new concern organized to handle the E-M-F, Flanders and Flanders Electric in Columbus, Ohio. George R. Thomas is general manager. The salesroom and repair department is located at 264 North Fourth street.

LOUISVILLE, KY.—Exhibitors at the Kentucky State Fair this week included the following: Wilder Motor Car Company, Everitt car; Banks Motor Car Company, Ford car; Studebaker Corporation, E-M-F and Flanders cars; Louisville Auto Supply Company, accessories; Racine Auto Tire Company, Racine tires.

MINNEAPOLIS, MINN.—A deal for a three-story garage and sales building at 1629 Hennepin avenue was closed last week by L. W. Place, assistant general manager of the Olds Motor Works, of Lansing, Mich., with L. H. Fawkes. The structure, including property on which it is to stand, will cost nearly \$100,000.

COLUMBUS, OHIO.—The Broad-Oak Automobile Company, 622 Oak street, Columbus, Ohio, has taken the central Ohio agency for the Chalmers and Pierce-Arrow for the season of 1912. The territory covered for the Chalmers consists of eight counties surrounding Columbus and the territory covered by the Pierce-Arrow is ten counties.

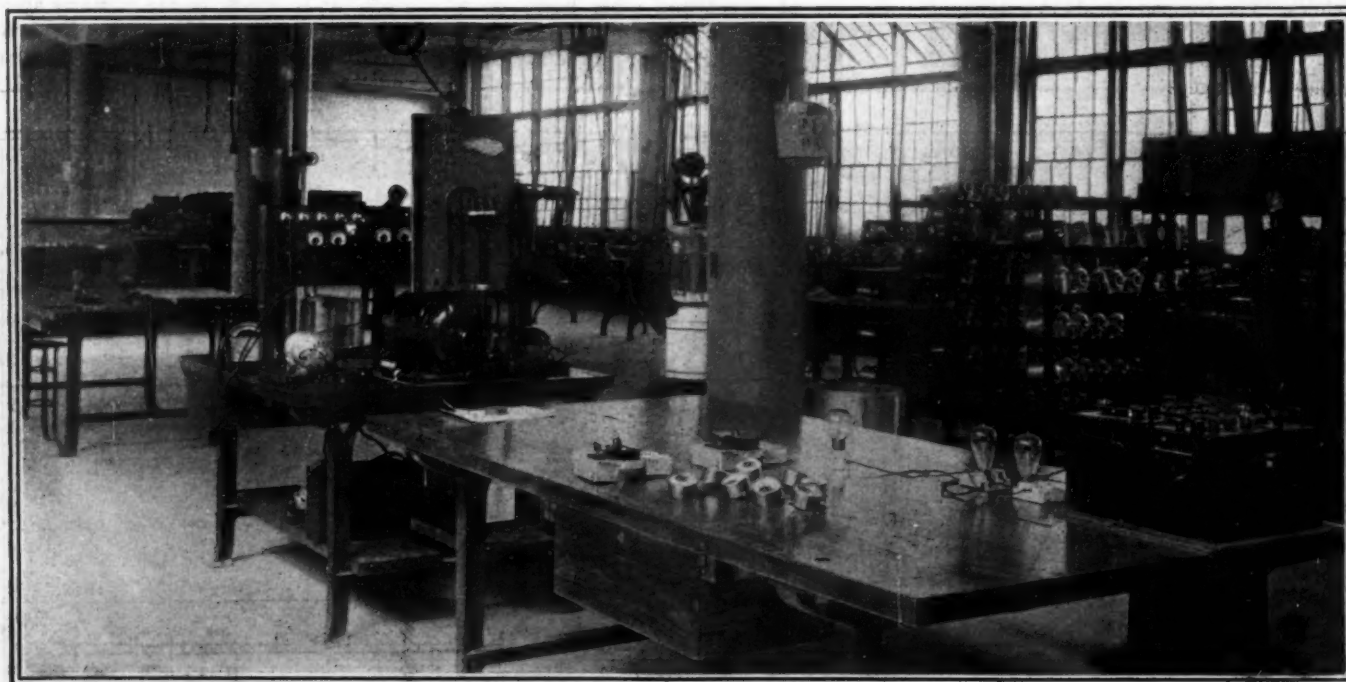
APPLETON, WIS.—Kenneth W. Brewer, formerly principal of Appleton High School and more recently traveling representative of the Baker Motor Vehicle Company, has organized the Brewer-Baker Company to distribute the Baker electric in Indiana and Kentucky. Headquarters have been established at 426-428 North Capitol avenue, Indianapolis.

GRAND RAPIDS, MICH.—The former Grand Rapids Overland agency and the Economy Garage have been merged and will henceforth be known as the Overland Motor Company, with salesrooms in the newly built garage on Island street. Repair rooms and day and night garage service will be maintained in the old fire engine house on Lagrave street between Island and Oak streets.

WASHINGTON, D. C.—Plans are under way to organize a sociability run from Washington, D. C., to Winchester, Va., on October 16, at which time the Glidden tourists will pass through that historic town. Winchester is the nearest point to Washington the Glidden tourists will touch and the run is being planned to give the national capital motorists a chance to see the big Glidden caravan.

WILMINGTON, DEL.—The T. C. Bradford Company, at Tenth and Tatnall streets, and the Wilmington Automobile Company, nearly opposite on Tenth street, have announced that they will handle new lines, the former having taken the agency for the Premier, and the latter for the Chalmers car and Alco truck. The Gomery-Schwartz Motor Company has established a Hudson-Garford agency at Fifth and Orange streets.

GRAND RAPIDS, MICH.—The automobile exhibit at the West Michigan State Fair was the largest in the history of that exposition. There were seven exhibitors as follows: Grand Rapids Auto Company, E-M-F and Flanders 1912; Moran Auto Sales Company, Maxwell; Overland Motor Company, Overland; John Vlasblom, 1912 Mitchell; S. A. Dwight, Everett; W. S. Farrant, Chalmers and Studebaker electrics; Becker Auto Company, Ford.



Where the inspections and tests are performed upon meters, instruments, cutouts, etc., at the Gray & Davis factory. The first bench is for general inspection and the second is used for the running tests

MILWAUKEE, WIS.—Jay E. Morehouse, State distributor of the Cole, has been appointed Wisconsin distributor for the Hupmobile, succeeding the Hearne Motor Company, Chicago and Milwaukee. Mr. Morehouse has leased the large garage at 82-84 Farwell avenue. The headquarters of the Wisconsin branch of the Winton Motor Carriage Company, which have been located with the Hearne branch at Eighth and Wells streets, have also been transferred to 82-84 Farwell avenue.

COLUMBUS, OHIO.—The Hudson Motor Car Company, of Columbus, Ohio, 243 North Fourth street, agent for the Hudson and American in thirteen counties in central Ohio, has made the following contracts for subagencies for the coming year: W. L. Gage Automobile Company, Logan, Ohio; Madison County Automobile Company, London, Ohio; Charles W. Stevens, Newark; The Mader Auto Company, Circleville, and the Gaither Automobile Company, Springfield, Ohio.

SAN FRANCISCO, CAL.—A complete rearrangement of the agencies handling the tires of the United States Tire Company in northern California has just been effected. The distribution of the Morgan & Wright and Hartford lines has been taken over by a direct branch of the United States Tire Company, with headquarters at 414 Van Ness avenue. The G & J line is placed with Weinstock-Nichols Company, who until now have handled the Morgan & Wright line, and whose vice-president, A. D. Nichols, was the inventor of the Nobby tread. The Continental line goes to the Gorham-Revere Rubber Company. Chanslor & Lyon, former distributors of the Hartford tires, have taken the Pacific Coast agency for the Kelly-Racine tire.

NEW YORK CITY.—The American Express Company has just placed its fifth repeat order with the American Locomotive Company for Alco trucks. This order calls for three more 3 1-2-ton trucks. With these three trucks the American Express

Company has thirty-one Alcos in its service. Twenty-five of these are used in New York City and three in Chicago. The trucks just ordered will be placed in the New York service, and will be used for transfer work.

Automobile Incorporations

AUTOMOBILES AND PARTS

BOSTON, MASS.—Paddon Motor Co.; capital, \$3,000; to deal in automobiles. Incorporators: Samuel N. Paddon, John Wilbur Paddon, Charles R. Codman.

CAMDEN, N. J.—Auto Chemical Fire Engine Co.; capital, \$1,000,000; to manufacture self-propelled fire equipment. Incorporators: F. R. Hansell, I. C. Clow, John A. McPeak.

CHARLESTON, S. C.—King Automobile & Repair Co.; capital, \$5,000; to deal in motor cars and repair them. Incorporators: S. B. King, Jr., W. A. King.

CHICAGO, ILL.—Packard Motor Car Co., of Chicago; capital, \$50,000; to manufacture and deal in automobiles. Incorporators: Leslie J. Ayer, William Fogel, William L. Barnum, Jr.

CLEVELAND, OHIO.—Joseph Cormier Co.; capital, \$2,000; to deal in automobiles, parts and accessories and to do a general machine and repair business. Incorporators: R. M. Calfe, J. G. Fogg, John F. Wilson, Joseph Cormier, Charles M. Selling.

COLUMBUS, OHIO.—Motorette Co., of Columbus; to sell Motorettes in its territory. Incorporator: H. B. McElroy.

DALLAS, TEX.—Munger Automobile Co.; capital, \$2,500; to sell automobiles. Incorporators: S. I. Munger, Sr.; S. I. Munger, Jr.; L. R. Munger.

DAYTON, OHIO.—Heatherman-Solliday Motor Co.; capital, \$20,000; to manufacture and deal in automobiles, parts and accessories. Incorporators: Frank B. Heatherman, Charles H. Solliday, Grace B. Heatherman, Zora Solliday, Joseph D. Chamberlain.

LIMA, OHIO.—Blevins Motor Sales Co.; capital, \$5,000; to deal in automobiles. Incorporators: H. W. Blevins and others.

NEWARK, N. J.—Commercial Car Sales Co.; capital, \$5,000; to sell automobiles. Incorporators: Joseph J. Rafter, John T. Walsh, John W. Phillips.

NEWARK, N. J.—Commercial Motor Truck Construction Co.; capital, \$125,000; to make trucks. Incorporators: Wm. Dimond, J. True, W. Turton.

NEW YORK CITY.—Beasley Company; capital, \$150,000; to manufacture, sell and store automobiles, machinery, etc. Incorporators: Robert F. Pratt, Albert E. Beasley, Thomas Moynam.

NEW YORK CITY.—International Auto Sales Co.; capital, \$25,000; to sell automobiles. Incorporators: Henry J. Levy, David Schwartz, Aaron Klein.

Morgan Sales Co.; capital, \$15,000; to deal in automobiles and accessories. Incorporators: Pierre A. Proal, Chas. A. Duerr, Edgar B. Lynch.

RIDGEFIELD PARK, N. J.—Ridgefield Engineering Works; capital, \$125,000; to manufacture engines, machinery, etc. Incorporators: Robert Burns, Jr., Samuel J. Katzberg, Daniel W. Steele, Jr.

ROCHESTER, N. Y.—Overland Rochester Co.; capital, \$30,000; to manufacture engines, etc. Incorporators: Edward D. Creed, Royal R. Scott, Clifford F. Cribb.

YOUNGSTOWN, OHIO.—Cutting Motor Sales Co.; capital, \$5,000; to deal in automobiles. Incorporator: J. B. Ditchon.

AUTOMOBILE GARAGES, ACCESSORIES, ETC.

BUCYRUS, OHIO.—Punctureless Tire Co. of Ohio; to deal in Dahl punctureless tires.

CAMDEN, N. J.—Stone Harbor Garage & Marine Railway Co.; capital, \$95,000; to operate garages and marine railways. Incorporators: Charles L. Large, Louis H. Matthez, John D. Yarrow.

CHICAGO, ILL.—Sheridan Park Garage Co.; capital, \$5,000; to deal in motor vehicles and conduct a general garage business. Incorporators: Harold H. Hart, James P. Doane, Marie Phillips.

JERSEY CITY, N. J.—Mechanical Rubber Tire Co.; capital, \$100,000; to manufacture tires and other rubber goods. Incorporators: William T. Wheeler, Frank B. Crawford, Frederick Carter.

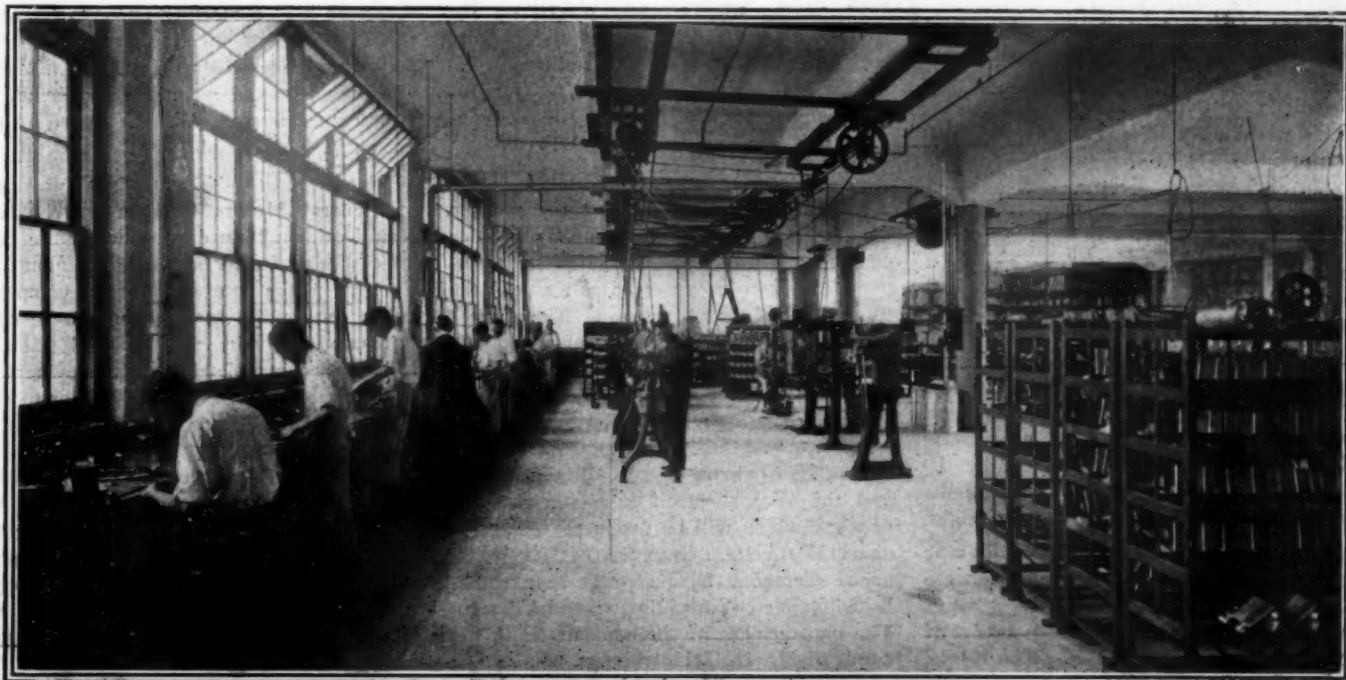
JERSEY CITY, N. J.—Metropolitan Motor Speedway Association; capital, \$1,500,000; to conduct races, exhibitions and contests with automobiles, airships, etc. Incorporators: I. Newton Quimby, Francis V. Dobbins, Edmund S. Johnson.

LOUISA, KY.—Hays Oil Co.; capital, \$10,000; to make and refine lubricants, etc. Incorporators: Tom Hays, G. R. Burgess, H. C. Sullivan, D. J. Burchett, J. L. Carey.

NEW YORK CITY.—Endurance Tire & Rubber Co.; capital, \$10,000; to manufacture tires and other rubber goods. Incorporators: W. G. H. Randolph, Edward W. Tabor, James E. Bennett.

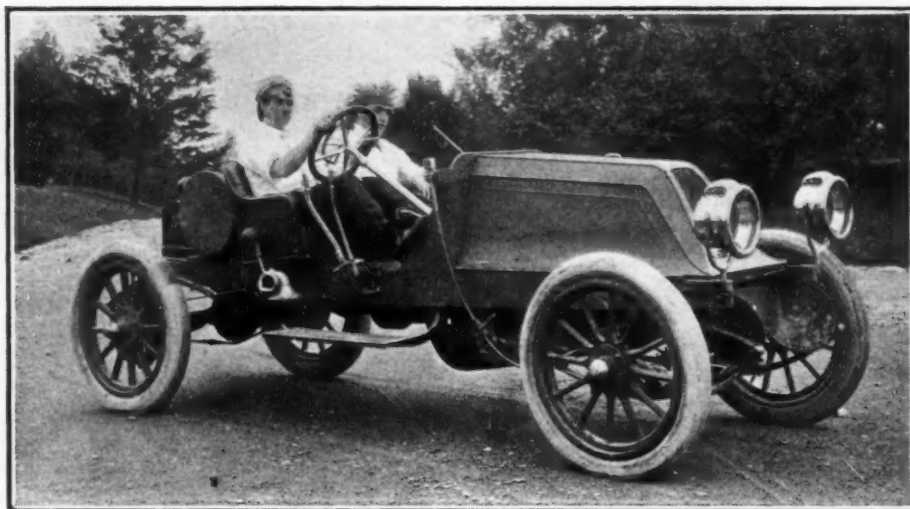
NEW YORK CITY.—J. H. Simms Co.; capital, \$10,000; to manufacture and deal in automobile accessories, supplies, etc. Incorporators: J. H. Simms, C. F. Oscar, Arthur Meyer.

SIOUX CITY, IA.—E. C. McCormack Co.; capital, \$10,000; to conduct a general garage business. Incorporators: E. C. McCormack, H. W. Hopewell.



Machine toolroom and assembling floor of the factory, showing a general scene in the interior of this important section of the new plant. Light is plentiful and space has been arranged with a view to efficiency

OF INTEREST *to the* INDUSTRY



New Franklin racing car recently built for Ralph C. Hamlin, of Los Angeles, Cal.

LOS ANGELES, CAL.—The Franklin Automobile Company has shipped to Ralph C. Hamlin, its local dealer, a racing car built on a model D chassis which Ralph C. Hamlin is to enter in the Los Angeles-Phoenix Desert Race November 4-6. The car may also be entered in the Los Angeles Motordrome and Santa Monica races. The chassis is stripped, bearing only the seats, gasoline tank and tool box.

ST. LOUIS, MO.—The Bond Motor Car Company, which has represented the Franklin Automobile Company in 26 of the 115 counties in Missouri, is to cover the entire State this coming season.

TOLEDO, OHIO—A deal was this week consummated by which H. H. Dennis, manager of the Rambler Motor Sales Company, of Toledo, will have the exclusive agency of the well-known Detroit Electric in that territory.

CALGARY, ALBERTA—The Austin - Dick Company, of Calgary, Alberta, has been signed up as a dealer by the Franklin Automobile Company, succeeding the Alberta Franklin Company. The territory is the entire province of Alberta.

RACINE, WIS.—The Racine Manufacturing Company, one of the largest builders of motor car bodies in the country, has been obliged to establish a 24-hour-per-day schedule in most departments and by the end of the month will be working its entire plant all hours of the day and night.

ANDERSON, IND.—The Remy Electric Company has closed a contract whereby the Russel Motor Car Company, of Melbourne, Australia, will become general agent of Remy devices in that country. The Russel Motor Car Company is a large Toronto firm, with branches in the principal cities in Canada and Australia.

TOLEDO, OHIO—The local branch of the Buick company will be closed out on October 1, according to information given out by Manager George P. Dowling, and the northwestern Ohio business will thereafter be handled on an agency plan.

DETROIT, MICH.—Claude S. Briggs has resigned as general manager of the Brush Runabout Company to head a new motor car concern in Detroit. The new car will be named the "Detroiter" and will be built in two models—five-passenger tourist at \$700 and a two-passenger roadster at \$650.

DETROIT, MICH.—W. A. Crowe, of Detroit, Mich., who recently placed on the market a new car known as the "Crowe 30," is negotiating with the Industrial Association of Grand Rapids, Wis., for the establishment of the plant in the Wisconsin city. The car is designed by W. W. McIntyre.

DETROIT, MICH.—To market the product of the Marquette Motor Company, a sales company, known as The Marquette Company, has been incorporated as a subsidiary to General Motors Company. The officers are as follows: Thos. Neal, president; O. C. Hutchinson, vice-president and manager; James T. Shaw, treasurer; Standish Backus, secretary; T. S. Merrill, assistant secretary and assistant treasurer. The Marquette Company will handle the Rainier and the Welch-Detroit cars, likewise the new car which will be produced under the name Marquette. Branches of The Marquette Company have already been established in New York, Boston and Chicago. The management of the company is in the hands of Mr. O. C. Hutchinson, who is also vice-president. The headquarters of the company are 1302 Jefferson avenue, Detroit, Mich.

LIMA, OHIO—The following officers have been elected by the stockholders of the Gramm Motor Company: President, A. L. White; vice-president and general manager, B. A. Gramm; treasurer, W. T. Agerter; secretary, F. E. Lamb. The stockholders also authorized an increase in the capital stock from \$500,000 to \$1,250,000.

PHILADELPHIA—What is undoubtedly the most handsome and complete structure of its kind in Automobile Row has just been completed at No. 319 North Broad street and will henceforth be the Quaker City home of the Packard Motor Car Company, of Philadelphia. The new building is eight stories in height and built of steel and reinforced concrete, affording every facility for promptly and effectively handling the increasing business of the company and for rendering a most complete service to Packard users. The company owns the whole block on which the structure stands, 302 feet deep, upon which, should business development warrant it, the present building could be duplicated. The building is handsomely furnished.

FINDLAY, OHIO—The Gramm Motor Car Company, which removed from Bowling Green to Lima early last Spring, held its first annual stockholders' meeting at Lima last Wednesday and elected the following directors: A. L. White, B. A. Gramm, F. E. Lamb, W. T. Agerter and M. Bernstein. The capital stock of the company has been increased to \$1,250,000. Of this amount \$750,000 is common and the balance is 7 per cent. cumulative stock. The directors held a meeting immediately after the stockholders' meeting and elected the following officers: President, A. L. White; vice-president and general manager, B. A. Gramm; treasurer, W. T. Agerter, and secretary, F. E. Lamb.

NEW YORK CITY—Thomas Neal, president of General Motors Company, arrived in New York on Saturday on the White Star liner "Cedric," after spending the month in Europe in the interests of the company. While in London arrangements were consummated whereby the Bedford Motors, Ltd., passed completely into the ownership of General Motors Company. Prior to this time General Motors Company owned a part interest in the English concern, but through the new arrangement the Bedford Motors, Ltd., will be operated under the exclusive control of the big Detroit company. It will be used largely for the purpose of placing the Buick car on the foreign market. The Buick chassis will be exported directly from the Flint plant and completed in the London factory of the Bedford company, whence the cars will be distributed all over the transatlantic market.

PATENTS GONE TO ISSUE

COMPENSATING MECHANISM—A balancing gearset for the driving axle of motor vehicles.

4. As Fig. 3 shows, this mechanism for a two-section axle consists in principle of a drive member loosely sleeved over both of the meeting axle ends and provided with an internal divided chamber, a friction rim mounted on each of the ends mentioned within the internal chamber, and means within these rims to make separate locking engagement thereof with the drive member above referred to.

No. 1,000,870—to John Frank Rogers, Cleveland, Ohio. Granted September 12, 1911; filed August 10, 1908.

TWIST DRILL—New and singular form of drill.

5. The drill is formed from a flat bar and has a tapered shank which is twisted alternately in opposite direction a number of times.

No. 1,002,846—to Frederick W. Hoefer, assignor to Hoefer Manufacturing Company, Freeport, Ill. Granted September 12, 1911; filed January 20, 1910.

MEANS FOR ENGINE COOLING—A system proposed for internal combustion engines.

3. The invention covered by this patent (Fig. 2) refers to the combination of an internal-combustion engine cylinder, with a water reservoir, a blower receiving water in minute quantities from that reservoir so as to form moistened air, and a mantle around the cylinder where the moistened air is led to cool the surface of the cylinder. The reservoir is encased and communicates with the blower space, and means are provided connecting the mantle around the cylinder and the casing.

No. 1,003,290—to Roberto Fritz Emil Okrassa, Antigua, Guatemala. Granted September 12, 1911; filed May 13, 1910.

CLUTCH—The combination of two members with a pawl.

1. This clutch is composed of a continuously rotating drive part and a driven member carrying a pawl movable to engage thrust portions of the driving member. The pawl is normally coacting with means for holding it back from engagement with the thrust portions mentioned and having a cam surface; a projection revolves with the driven member and at each revolution co-operates with the cam surface to move the above-mentioned means to normal position, a mechanism being also provided to shift the means retaining the pawl.

No. 1,002,853—to William H. Lanning, Jr., Toledo, Ohio. Granted September 12, 1911; filed June 12, 1911.

OIL CAN—A positive-working oiler.

1. The oil can comprises a receptacle and spout, a spout-closing valve seated in the end of the spout, a valve for admitting air to the oil receptacle, means for opening both valves simultaneously, means for keeping both normally closed and locked.

No. 1,002,995—to August Ivar Johnson, Concord, N. H. Granted September 12, 1911; filed December 19, 1910.

RADIATOR—Water-cooling apparatus of the cellular type.

3. The radiator has a vertical rear wall provided at its edge with a bead which projects laterally and rearwardly from the wall and which is provided at its rear edge with a rearwardly projecting flange adapted to support an engine hood, a peripheral wall being provided at its rear edge with a bead which projects laterally and rearwardly and which is secured over the head of the rear wall above referred to.

No. 1,002,978—to John M. Fedders, Buffalo, N. Y. Granted September 12, 1911; filed May 27, 1911.

VARIABLE-SPEED GEARING—A combination of two shafts carrying stepped gears.

2. This patent relates to the combination in a variable speed mechanism, Fig. 1, of two parallel shafts, one driven and the other driving, oppositely stepped gears on these shafts, slides located intermediate these shafts adjacent the ends of the stepped gears and a bar slidably supported in the gears. On this bar is mounted an intermediate gear adapted to mesh with the opposite stepped gears, means being provided to shift the slides in order to move the bar laterally to bring the intermediate gear into or out of mesh with the stepper gears.

No. 1,003,221—to Gustav Wagner, Reutlingen, Germany. Granted September 12, 1911; filed July 15, 1909.

STEERING GEAR—A steering equipment of the worm block type for automobiles.

4. The patent refers to the combination with a steering wheel of a rotary stem on which the wheel is mounted and having its lower end journaled in a casing. A longitudinally movable member having a screw and nut engagement with the stem and slidably engaging with the casing mentioned is cut away at one side intermediate its ends. Through the aperture in the movable member a stationary tubular member within the rotary stem is secured to the casing, a stationary segment being mounted on this tubular member above the steering wheel; the tubular member contains a rotary shaft connected with a control lever. Through the cutaway portion of the longitudinally movable member passes a laterally extending shaft which is connected with the rotary shaft within the steering stem.

No. 1,001,258—to George W. Dunham, Detroit, Mich., assignor to the Hudson Motor Car Co., Detroit. Granted August 22, 1911; filed March 4, 1910.

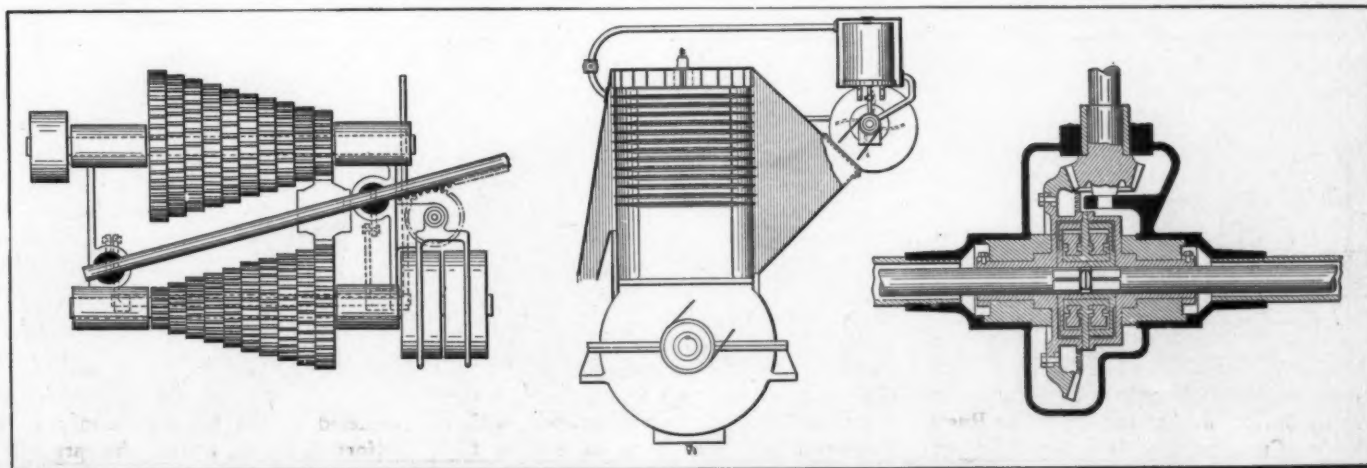


Fig. 1—Wagner variable speed gearing

Fig. 2—Okrassa engine cooling system

Fig. 3—Rogers compensating gearset

Newest Ideas Among the Accessories

Norma Bearings

NORMA bearings, which are being manufactured by the Norma Company, Stuttgart, Germany, are now being introduced in the American market

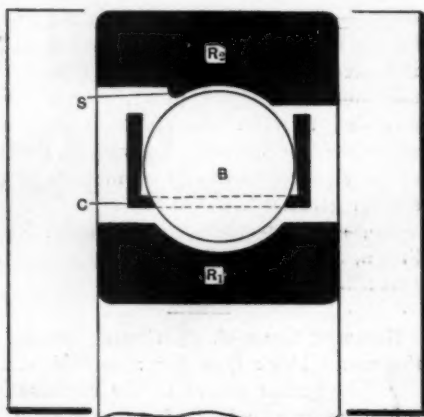


Fig. 1—Section of Norma annular ball bearing

by the Norma Company of America, 20-24 Vesey street, New York City.

The Norma annular ball bearings, illustrated in Figs. 1 and 3, have the outer race R_2 open on one side, permitting of disassembling the bearing altogether. It is possible to mount all parts independently of one another, they being of standard sizes and interchangeable. The outer race with its open side makes it possible to mount the bearing in inaccessible places, either with or without allowance for lateral play.

As the parts of the ball bearing in Fig. 3 show, the outer circumference of the inner race R_1 is shaped with an annular cavity C into which the balls fit. The cage is of brass, the walls having indentations to accommodate the steel balls which project through openings into the inner race, where they rest in the concave annular space. As the section, Fig. 1, shows, the inside

of the collar is stepped off so as to take up end thrust if necessary. Norma ball bearings are made in standard dimensions for light, medium and heavy service.

The Norma roller bearings are shown in Figs. 2 and 4, and like the ball bearings are made with a high degree of accuracy, using the Hirth minimeter for the manufacture of the parts. The outer race R_2 of the roller bearings is open-sided, giving it the same advantages as those noted in the case of the Norma ball bearing. Short cylindrical rollers R which take the load are held and guided in a substantial steel cage by means of pins, being secured against skewing. The outer race is provided with a slightly convex track for the rollers; the inner race R_1 is a hollow cylinder, both races being securely fastened when mounted.

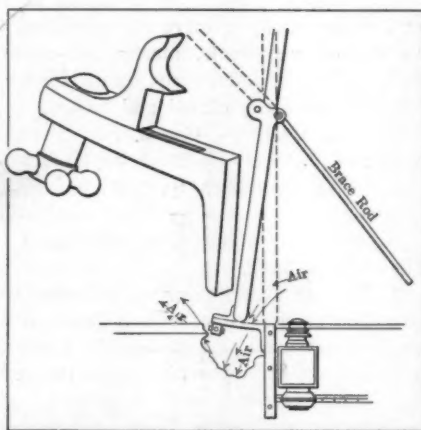


Fig. 5—Cyclone ventilator windshield and special brackets

The shaft of the roller bearing is capable of being axially displaced, but the bearing is not intended to take up thrust.

The dimensions of these roller bearings make them interchangeable with ball bearings of standard measurements.

Cyclone Ventilator Shield

In Fig. 5 is depicted the Cyclone Ventilator wind shield, made by the Sprague Umbrella Company, of Norwalk, Ohio. The construction of this shield permits of

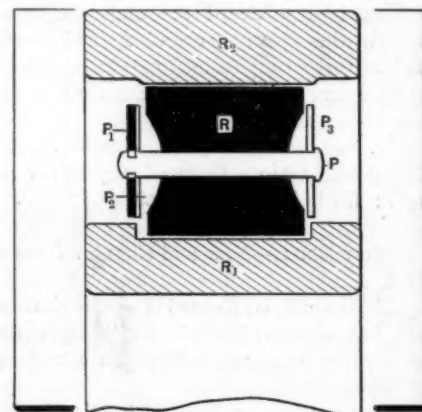


Fig. 2—Section through Norma roller bearing

placing it in such a position that the air current met by an advancing car is deflected below the cowled dash. The shield is attached to the dashboard in the manner shown in the cut, and while the position of its upper portion may be regulated by means of the brace rod illustrated, the entire shield may be moved forward or rearward owing to the special construction of the bracket shown in the upper left portion of the accompanying illustration, Fig. 5. The two feet of the windshield are rigidly fastened to such brackets, two of them being provided, and, as the illustration shows, mounted on a holder securely bolted onto the dashboard. This holder has a guideway cut in it in which slides a finger-wheel serving to hold the windshield in the desired position; it is loosened to move the shield and locked when it is desired to keep the shield in place.

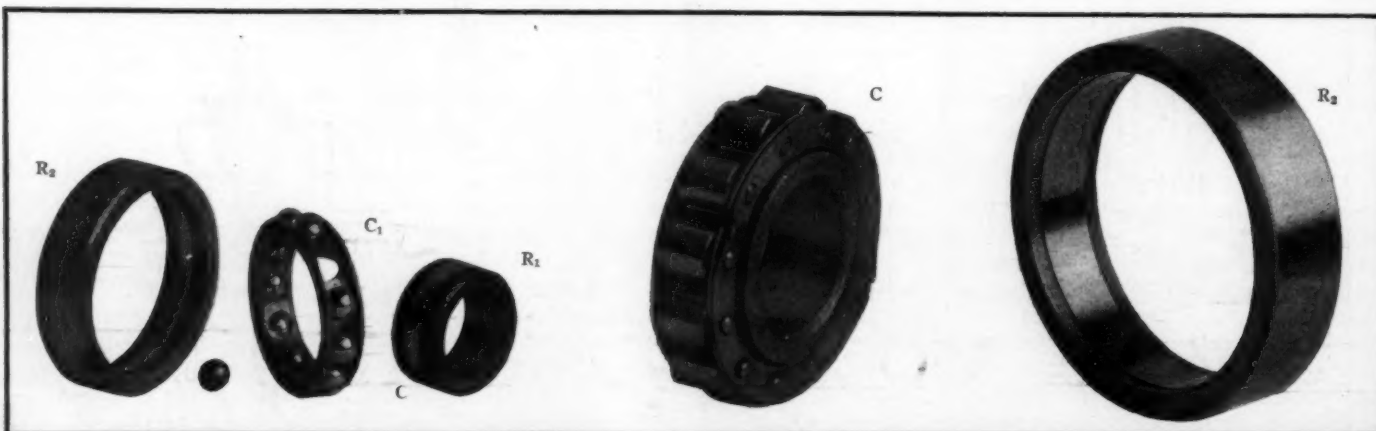


Fig. 3—View of disassembled Norma annular ball bearing

Fig. 4—View of component parts of Norma roller bearing